

Inadequate Data Gives Users Sort Timing Mystery

So, you think the people who design your software always have the answers, do you? Or perhaps that those dozens of pages of estimated timings that go around with sort programs really have the answers in them if you look far enough? Well, perhaps they have, but at the moment I have a mystery on my hands which they do not appear to solve, or even to have an

The Taylor Report

By
Alan Taylor, CDP



approach to!

It is an important mystery, too, at least for many DOS users with disk sorting jobs using around 40K partitions or more (for smaller systems there is another problem — see box, "But, If You Use Under 50K...").

Time and Dollars

It is important because the users may be wasting a lot of computer time — up to half the time they spend sorting. It is important because they now have to decide in a free and open market — and that is important simply because it is new, and few of us have any real experience buying software in this way.

What these installations have to

decide is whether to rent IBM's new sort package, SM-1, or Programmatic's plug-for-plug equivalent, PI Sort II, or either of them. The two packages both promise better performance than the free IBM Sort 483, and rent for about the same price (IBM's is slightly cheaper at \$80 per month as against Programmatic's \$100).

It is not an easy problem because, while both sides offer comparisons with the IBM Sort 483, what a user really wants to know is just how the new sorts compare.

Documentation Inadequate

I checked into this, and played with the IBM timing estimates. But Programmatic's had no

equivalent sets of tables, so that did not get me very far. Then I took the easy way out — I ran a set of tests.

In designing the tests I used the IBM general testing method as a model, using random keys to obviate bias, and found that while the IBM Sort was improving performance in most of the cases, there was a sufficient number of cases where it did not improve the performance to keep the expected improvement down to around 4%, compared with Sort 483. PI Sort II did much better, improving the performance in almost every case, and averaging a performance improvement of 11% — or nearly three times as much.

Were Tests Valid?

With such a difference I naturally went to check on the validity of the tests themselves, and started looking rather doubtfully at the whole idea of using random numbered keys.

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

After all, the real world does not use completely mathematically guaranteed random numbers when it is sorting, and both the sorts claimed it gave improved performance when there was any order available, while IBM more cautiously said that when the order was nice for its sort, its performance would be improved — but if it was nasty, then the performance would be degraded.

This leaves a user nowhere if he does not know how to find out just what amount of order his files have, and if he does not know how much will be the improvement or degradation for a particular amount of order.

Up to 50% Saved

So then I started using real-world files. And that is where the trouble started. Because if PI Sort had beaten SM-1 when random keys were used, it almost left it at the post with real-world cases. Previously, the best improvement had been to cut 25% off the sorting times — now 50%

was being cut off in some cases. And yet, the same ratio of about two or three times more improvement (by comparisons with 483) was holding when the same files were sorted by IBM's Sort SM-1.

I asked David Ferguson, Programmatic's president, just what did make the difference, and he again told me it was the amount of order. Burrowing deeper, however, I found this was an oversimplification, because, while I could mathematically easily control the amount of order in the file from one record to the next, what really was controlling it was the frequency on which a fresh item fell on one side or another of a movable barrier.

(For technical people, the PI Sort uses a double tournament approach, and the amount of room available for the entries into the first tournament, which is already being placed out on the disk, is inversely proportionate to the amount of room required to hold entries for the next tournament.)

And the frequency of falling on one side or other of the barrier is a matter of probability, rather than order.

Test Shocks

Now, of course, while randomness is the unbiased way of treating something that is order-sensitive, it appears to me that it is a misleading way of treating something that is probability-sensitive. It is like testing the shock-absorbing qualities of a car by driving it over an artificially smoothed expressway.

And, as far as I know, there is just no way of forecasting sort performance on real files as yet. Until there is, the user will just have to try and see. And, based on the quite extensive tests I have taken, it looks as though the Programmatic's Sort is beating the SM-1 when the two are compared — and beating it substantially. Therefore, I suggest you try the PI before you buy.

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Excerpts From Questionnaire Responses

Keep it secret — a good set of questions is too hard to develop not to be reused. — T.C. Willoughby, Ph.D., CDP, Pennsylvania State University.

Some secrecy should be removed. Select textbook authors should be given enough information and sufficient lead time to print meaningful study guides.

The tests themselves should not be made public. There might be a tendency for last year's tests to become next year's study guide. This would do more harm than good. I have seen outstanding examples of study guides which lead the reader to a better understanding through learning, not memorization. The authors can do an outstanding job if they know what the examination is all about. Let's tell them and only them. — Ray M. Whitt Jr., CDP, vice-president, data processing manager, Financial Facts, Inc. Los Angeles, Calif.

The exam, including answers, should definitely be published. Old exams are the best criteria a prospective examinee can have to determine if he is qualified to sit. That the old exams are published will not make it more difficult to design new ones. Our field is changing more rapidly than any other. In fact, even if the case problem questions did not change, the answers would.

DPMA's approach to the academic requirements' question is a classic example of the wrong approach. They decided to chop the degree requirement. Why did they increase the experience requirement? Either they are admitting error on both counts (unlikely), this is a compromise solution, or they just felt something must be put in any time something is taken out. Only the second option makes any sense. — Michael J. Mullaugh, CDP, Pittsburgh, Pa.

Until we become a "professional" group and consider ourselves by our unselfish actions and our total awareness of the public trust, and the certification is regulated by a governmental body, I do not believe I will take the certification exam. — William A. Adams, Dearborn, Mich.

The central issue with CDP is its significance to the holders and to industry. This country does not need another national organization with an executive secretary, staff, overhead and dues.

We do need an effective means of measuring and identifying qualified professionals... the structure for doing this will only be effective if it is more concerned with service to the profession than with job preservation and trumpet blowing. — M. Harvey Segall & Assoc., Tacoma, Wash.

I have followed with interest your comments and observations regarding the CDP. The issue of recognition for those who have taken the "\$50.00 Test" must continue to be openly discussed if we of the data processing industry are to ever be considered professionals in the traditional sense.

Clearly if the CDP is to be promoted to the world it will take organization and money. The Taylor Report of May 19 indicates the money problem may be well in hand. DPMA has the organization to promote the CDP and currently has the money to do so. The CDP holders, however, are increasing in number (12,500 by now?) and are in a position to act with grouped

voice. Giving credit to DPMA, the CDP holders should consider a formal organization to seek their goals and objectives. — F.M. Weaver, MBA, CDP, Kettering, Ohio.

If the CDP is to become an active organization, then it must provide its members with useful information. Specifically, a set of standards which can be used to evaluate a data processing shop against.

Having recently been transferred from a large corporate shop to a newly acquired company, small in size, I am keenly aware of the results of lack of standards.

The Aicpa has set up accounting practices which guide firms on current accounting practices: why not have the CDP do the same? For instance:

- What is a good payroll system.
- What are acceptable balancing procedures.
- What are retention periods for data processible history and transaction files.
- At what points do Aicpa requirements affect DP standards and practices.

Wouldn't it be nice to have one place to find out these questions. Particularly in small DP shops, the time and resources to research these answers simply do not exist. — Albert T. Landberg Jr., Silver Spring, Md.

I am a member of DPMA and was a charter member of the St. Louis Chapter of NMAA. Professional organizations have a place in our lives, however, certifications should not be a part of such social operations.

It is my firm belief that the lowering of certification standards, by dropping the degree requirement, has and will in the future lower the CDP certificate to the equivalent of a high school diploma as compared to a Doctorate. This will cause any person with achievement-oriented standards to seek the CPA or LLB professional status with a minor in EDP or related fields. — John C. Cooper, BSA, MBA, MAA, controller, Northeast Missouri Electric Power Cooperative, Palmyra, Mo.

The CDP should mean to our profession what the CPA means to the accounting profession. Many people work in the accounting field, but only a relatively small percentage of them are CPAs.

Let's make our CDP exam adequate and thorough — let's even require recertification periodically. Above all, let's make the CDP really stand for the very best in our profession. — Ronald L. Redmann, CDP, Metairie, La.

I would not only support but would contribute any effort needed, any attempt to organize and professionalize the CDP concept.

Let me know if our graphics and publishing operation can be of help. — Curt Akin, Typo/ Graphics, Mystic, Conn.

I've always supported the proposed dropping of the college degree requirement. However, I hold a B.S. in math and have three years of DP experience. Now it looks like I have to wait two more years to take the exam.

Is this fair? Why can't anyone take the exam if he wants to spend \$50? If you pass it, you pass it; if you don't, you don't! — Robert B. Paulson, Arlington, Mass.

But, If You Use Under 50K...

While PI Sort may help users whose systems have large memories, and who are prepared to pay for their disk sort, it will not help those people who are wanting the best disk sort that they can get for free, and who use core sizes of around under 50K.

These users are still faced with the ridiculous choice of either accepting a substantial degradation in their performance (going with Sort 483) or risking the use of an unsupported piece of software — the faster Sort 450.

This, of course, is absurd. But no one is doing anything to get the users out of their bind, least of all IBM who has created this situation.

So I have considered the question, and found that the necessary experts to support Sort 450, and keep it running, are available. This means that Sort 450 can be supported, even if not by IBM. And this changes the picture.

The cost, naturally, depends upon the number of people who would want support, so as to keep that additional 10% to 20% performance edge. It looks as though it will be around \$125 per year.

Now the question is whether or not to launch it. If you would be interested in having the fastest IBM free Disk Sort (Sort 450 supported independently), please write to me and tell me so. If enough demand is there, then I can guarantee that support will be made available.

It is up to you now.

Quieting a Storm...

MINNEAPOLIS — Northern States Power Co. is using a computer to pinpoint electrical outages caused during storms in the Minneapolis metropolitan area.

The Minneapolis area records severe storms six or seven times a year which usually cause outages in the city and its suburbs. The initial result is a deluge of customer calls.

Now as calls come in, information such as customer's address, type of problem, lights out, line down is typed into a visual display terminal linked to an IBM 360/65 computer. The computer compiles related calls, separates calls on one feeder and number of customers affected and provides the actual location of the electrical protective device involved, such as a overhead oil recloser, line fuse or transformer.

Tiny Rockefeller University Solves a Big Problem

NEW YORK — The Rockefeller University computing center needed the mathematical capability and data storage capacity of a large computer, but the small number of daily tasks that would be scheduled for this computer didn't justify such a machine. The solution to the school's problem was a medium-scale machine with fast throughput and computation speeds at a cost well below that of larger computers.

Rockefeller University has little more than 100 students and a faculty of four to five times that number. All students are on the graduate level and their work, along with that of most of the faculty, makes it one of the most heavily research-oriented schools in the world.

It primarily needed, according to Dr. Robert A. Schoenfeld, director of the school's electronics and computer laboratory, a machine that could meet a variety of scientific needs from mathematical calculation to processing masses of data

from punched cards in a time period acceptable to the researcher. This latter requirement made the need for throughput and computation speed paramount.

The DEC PDP-15 is used in primarily a batch processing application (approximately 70% of its tasks are batch processing).

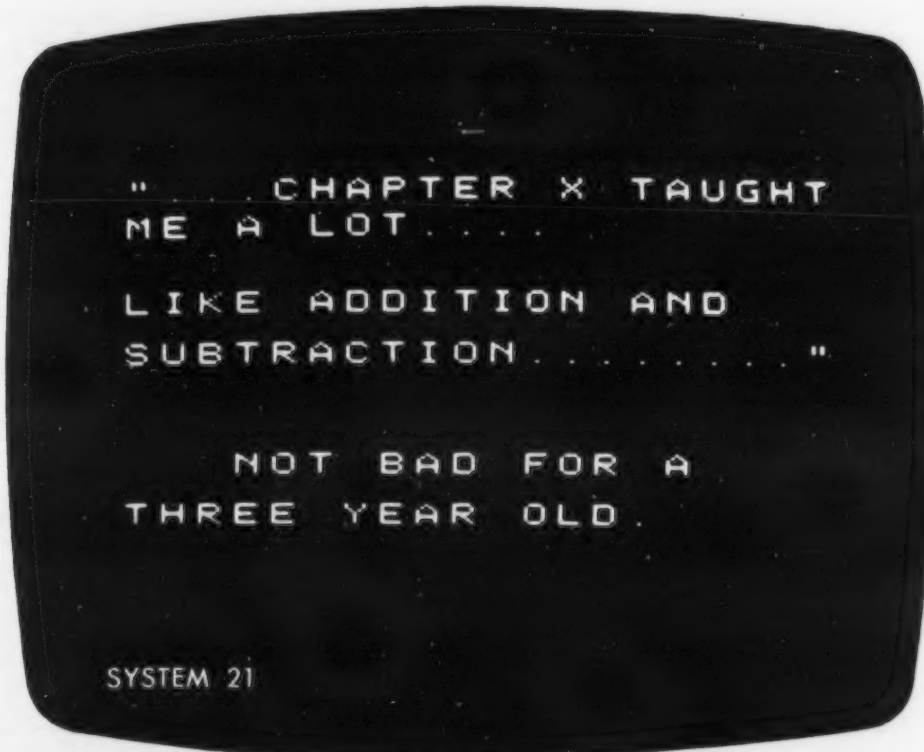
Since early January, there have been two batch runs a day with a third scheduled to be added shortly. At night and on weekends, the computer is available to any qualified student or faculty member once they have demonstrated their capability. During the day, there is an operator. At nights and on weekends, the users are on their own. Users are given a card that operates the door lock to the computer center.

When not processing research data in the batch mode, or being used in real time by a student or member of the faculty, the PDP-15 is processing data fed to it by a DEC Linc-8 laboratory com-

puter. The Linc-8 gathers data from three neurophysiology laboratories and feeds it through an interprocessor buffer to the PDP-15, enabling researchers in these laboratories to take advantage of the PDP-15's speed and the peripherals interfaced to it. These include magnetic tape and disk storage, high-speed paper tape reader and punch, high-speed line printer, card reader and plotter.

Projects include the study of animal learning patterns, the effects of methadone as a means of treating narcotics addiction, and the effect of contraception on population trends.

Between 50 and 100 persons use the system, and this number is expected to increase because there are plans to offer two courses on use of the computer. The first will be a basic course on operation and how to program in Fortran IV. The second course will go into more detail on the system and deal with more complex programming methods.



Sometimes growing up can be very difficult... and when you're the new kid on the block it's even harder. During the past three years, we've done a lot of growing up and we've learned a lot. But some things haven't changed.

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SYSTEM 21 is also a system of growth and has a way of staying young. Optional features — field installable — allow the system to keep pace with your changing needs. Now it can add and subtract — things like amount fields or control totals. It can't multiply or divide... just add and subtract. But that's not bad for a three-year-old.



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Insurance Company Automates Network By Going on Safari

HARTFORD, Conn. — Aetna Life & Casualty has automated its handling of car insurance to a degree it believes unsurpassed in the auto insurance industry.

Seventy-two offices from coast to coast can now process auto insurance through a large computer in the company's home office. The network, linked by telephone lines, allows the nation's fourth largest car insurer to slash the time required for many routine insurance operations from days or hours to seconds.

Within 10 to 15 seconds, Aetna's Safari system can calculate rates and issue a policy, change or renew a policy, prepare a bill or provide information needed to settle a claim.

Safari also delivers up-to-minute statistical reports to Aetna's management.

Safari stands for System by Aetna for Fast Access to Records and Information.

The number of auto insurance policies served by Safari will grow from the present 400,000 to 1.5 million by early 1973 and the system soon will be used to service other kinds of insurance more efficiently, according to an Aetna spokesman.

Development of the system consumed more than 300 man-years and involved over 100 Aetna employees. At present, Safari averages about 15,000 transactions per day over its 20,000 miles of leased telephone lines. Data is fed into the system and requested of it by 160 machine operators stationed at 258 terminals throughout the country.

German Store Uses Magnetic Tags, DP

CW European Bureau

RHEINHAUSEN, Germany — A cash-and-carry store handling 15,000 food lines and 25,000 non-food lines has opened here, equipped with Olivetti TC 600 terminals at the cash-out points.

The system generates invoices in real time on the basis of magnetic tags attached to each item and read by the terminal, which also reads an identification card for the customer and for the salesman, as part of the cash-out procedure.

Certain aspects of each transaction are stored on magnetic tape for subsequent management information processing, and the tag encoder units themselves are linked to the same computer, thus bringing details of the merchandise into the information structure for a complete picture to control stock, and analysis of movement trends for the various lines.



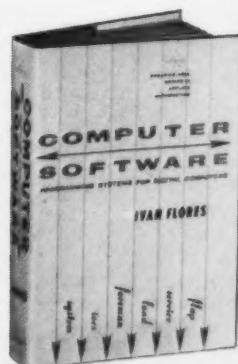
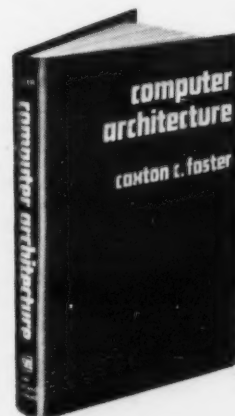
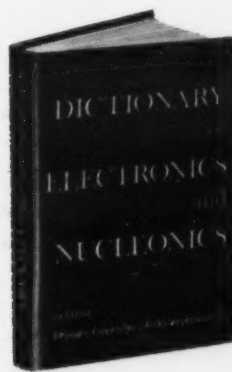
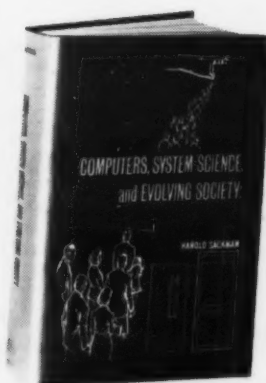
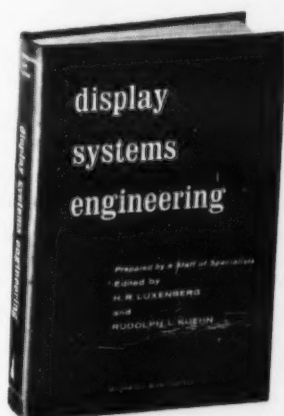
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Oil Dealers Turn to Bank Plan for Flexible DP Service

By Pat Meglin

Special to Computerworld

The burning question among fuel oil dealers these days is not "Shall we computerize?" but, "How shall we computerize?" It's a question that demands careful consideration because the wrong answer can lead to, at best, frustration; at worst, near disaster.

National Bank of North America has a plan for Long Island oil dealers to get the benefits of

sophisticated computer equipment without having to buy or lease the equipment or hire a computer programmer.

The bank sells dealers a computer service flexible enough to encompass both the firm that wants to get its feet wet by computerizing only its delivery records and the company that decides to go all the way through delivery, accounts receivable, sales distribution journal, historical ledger and its own

payroll.

Nassau Mutual Fuel Co. in West Hempstead, L.I., has been using North America's computer service for five years.

The firm's president, Jim Mulligan, says, "It's the only way I know of getting big business benefits at a reasonable cost." Before computerizing, Nassau Mutual's office staff had been handling eight different executions per delivery for about 25,000 deliveries per year.

The fuel company began using the service by having North America's DP center take over production of its delivery tickets, K-factoring and dispatch schedules.

North America's computer service allows the dealer to have his delivery tickets coded any way he wants them, with up to 13 lines of information on each ticket.

He receives his tickets from the DP center in degree-day sequence by zone, with a duplicate dispatcher's journal, thus eliminating hours of nuisance work.

The bank also offers dealers their choice of all or parts of its "Management Reporting Program."

Among the advantages of buying a service rather than a computer, Mulligan says, is that "you're not forced to make compromises as you would be if you were using a minicomputer. Nor do you have to worry about reprogramming the machine. The bank will modify the pro-

gram to suit your needs, so the computer gets the headaches, you get the benefits."

North America also supplies regular courier service that eliminates the need for costly telephone transmittal and its inherent problem of timed transmission.

Without in-house equipment, the dealer doesn't have the expense of paying his own programmer. He should, however, learn to read and interpret what the computer tells him. Elimination of detail drudgery gives him the time to evaluate and utilize the sophisticated information furnished by the program.

Summing up the benefits after five years' experience with the program, Nassau Mutual's president says: "The computer has relieved us all of the humdrum, nitty-gritty detail work that's indigenous to our business. It doesn't get tired, or bored, or sick, or have a fight with its wife. It's a marvelously efficient tool that has enabled us to improve the quality of our work and concentrate on the more important areas of business."

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Accident Cases Aided by State Trauma Registry

CHICAGO — A computer at the University of Illinois Medical Center Campus in Chicago is being transformed into a life-saving medical instrument to combat a \$20 billion health problem that kills more than 115,000 persons annually in the U.S.

The Medical Center Campus and Cook County Hospital's trauma unit, which have pooled their efforts, have established a computerized trauma registry to collect detailed information on the types and treatment of trauma cases, such as industrial and auto accidents.

Linking hospitals and physicians throughout the state, the program will allow individual doctors to draw information quickly from the computer.

Scofflaws Won't Be Waiting Long

BOSTON — Penny post cards — the six-cent variety — are being used to speed up computerized license suspensions by the Boston Municipal Court.

Almost 70% of the recipients of parking tickets ignore the tickets, according to Court Clerk Daniel J. Lynch, who added that the computerized 1,500 summonses per day are only beginning to reduce a two-year backlog of traffic ticket enforcement. So post cards are being used as legal summonses.

If a driver fails to pay within a week after the mailed summons, then the court computers tell the Massachusetts Registry of Motor Vehicles computers that the license has been suspended.

**There's more to a computer room than
the hardware, the software,
and the people.**



That "More" will be covered by Computerworld in the June 30th issue in the Accessories, Environment, and Security Supplement.

- Accessories — The magnetic tape, the disk packs, the continuous forms and envelopes, and the cards.
- Environment — The power supply & back up equipment, the air conditioning, the desks, filing racks, tape seals.
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Student Is Teacher, Computer a Pupil in 3-Year Project

By Marvin E. Aronson
CW Education Editor

HANOVER, N.H. — The student as teacher, the computer as pupil.

This makes for an unusual classroom but one which existed in June 1967 when Dartmouth College, with the support of a National Science Foundation grant, began a three-year project to explore the use of computing in secondary schools.

Eighteen schools in five New England states participated in the project.

The final report on "The Computer as Pupil: The Dartmouth Secondary School Project" was compiled by the principal investigator, Thomas E. Kurtz of the Kiewit Computation Center at Dartmouth, and John M. Nevison of Dartmouth.

One of the general conclusions of the report is that a student who learns by teaching a machine not only develops a new-found confidence in his own ability as a teacher and as problem solver, but he

experiences the joy of answering his own questions.

Discovering his own creative abilities as teacher, he finds a new delight in learning. It is this attitude which is all too often lacking in today's secondary school systems.

Education

The experience of the project, the report says, over the last three years suggests perhaps a new and excellent way to teach the "art of problem-solving is to give the student the responsibility of teaching various tasks to computers."

This kind of learning is as important as any of the current improvements that rapid calculations afford traditional classes, the report states.

The Dartmouth GE 635 computer was made available to students and their

teachers so that they could explore the classroom and extracurricular uses of computing.

The project primarily set out to prepare and train teachers in all relevant subjects and to prepare all teacher-written curricular materials ("topic outlines").

The project succeeded, the report says, in that "a viable computer-using community of secondary schools was established in New England" and these schools are also supporting the costs "largely on their own." They generally feel the educational benefits of computing were worth the cost.

A large corps of secondary teachers was trained in formal two- (and four) week sessions, thus showing "basic training" on the computer could require as little as a half-course, especially when done at the cooperating university. The course covered elementary programming, presentation of several applications of computing to mathematics and how to administer

teletypewriter usage.

Over 40 outlines were produced, thus showing that teachers with some support from the central institution can develop parts of courses and prepare their own material.

Some of the prerequisites of a successful school computer program as seen by the report are:

Equipment — A reliable computer terminal and a programming language that can be taught in a few hours to students (Basic).

Teacher Needs — Two to four weeks of training before the program starts.

Release time to work with students during the year.

Freedom to employ computing in classes.

Computing Introduction — Students learn to program in several hours; programming "courses" are obsolete.

Teachers are best taught at a summer institute where they can be allowed larger amounts of time to work on a terminal.

Usage-Present — The most important use of the computer is as a programmable device.

When the student teaches the machine, enormous creative energies are released in the student.

The median user obtains three or four 20-minute periods a month.

In a successful program, the number of active users per terminal per month should range:

In a public school — from 60 to 80.

In a private school — from 90 to 140.

Usage-Future — As the number of terminals increases and as computing is fully integrated into course work, 50 students will be on each terminal each month where the median user will have as many as:

10 twenty-minute periods a month in public schools.

16 twenty-minute periods a month in private schools.

Costs — Computing costs of approximately \$3,000 a year.

Additional costs for communications.

Benefits to the school — A healthy skepticism of computer results — "Who wrote the program?"

A widespread appreciation that "people think and computers do the work."

Benefits — to the teacher — A versatile aid to regulate class instruction.

Benefits — to the student — The discipline and clarity necessary to teach a machine to work for him.

The joy of seeing his program work.

The freedom to ask his own questions and independently explore possible answers.

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A self-contained tape drive is only one of 14 reasons why you should buy this new cleaner-certifier.

It can handle 556, 800, and 1600 BPI tapes. It cleans with a tungsten carbide blade and four silicone-impregnated tissues.

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That's 14 specific product advantages—14 reasons why you can justify taking the time to learn more about this new cleaner-certifier from VPC. (It's called the Model 14.)

Actually there is one more reason: our field engineers will show your staff how to get the most out of the Model 14 for your specific situation and guarantee that it performs with no problems. VPC has been manufacturing and selling tape cleaners and certifiers for a long time. We know what you need.

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10 California Colleges Linked in T/S System With Cal Tech Center

PASADENA, Calif. — A new computer time-sharing program linking 10 Southern California colleges with the Willis H. Booth Computing Center on the California Institute of Technology campus here is providing students with educational and research facilities previously beyond the budgets of the participants.

Up to 40 students from the participating schools use the computer, a large-scale DEC PDP-10, at any one time. In all, there are 64 terminals linked to the PDP-10. Nineteen are spread through Southern California in various departments of the participating schools, and the rest are on the Cal Tech campus.

Participating schools include California Lutheran College, Claremont Graduate School, Claremont Men's College, Harvey Mudd College, LaVerne College, Occidental College, Pitzer College, Pomona College, Scripps College and University of Redlands. The colleges purchase the computer time from Cal Tech with assistance from the National Science Foundation.

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Afips Says 200 Booths Booked for Fall

MONTVALE, N.J. — The tight money may have diminished the profit of the Spring Joint Computer Conference, but around 200 booths are already taken for the fall meeting in Las Vegas, according to recent discussions with the conference sponsors.

The American Federation of Information Processing Societies (Afips) admitted the tight economy was hurting its revenues, but outgoing President Richard I. Tanaka said a cost reduction program helped keep costs in line.

Break Even

This fact will allow Afips to at least break even on SJCC, even though exhibit booths were down by about 40% over the 1970 show, Tanaka indicated.

The impact of the tight economy hit Afips later than many

other show-sponsoring organizations, Tanaka stated, adding Afips is no worse off — and maybe better off — than other groups of its type, "if there are any comparable ones."

Even though the number of

Societies

booths and exhibitors was down considerably, Afips was quick to point out that this last show was still the fourth largest "joint" in history.

Will Affect Societies

The revenue drop will also hit the federation's constituent societies, which depend on these funds (from the Joints) for a considerable share of their oper-

ating expenses.

The societies had received projections of the expected revenues from SJCC in time to take action to head off potential cash flow problems, Tanaka stated.

There was also a drop in the number of booths at Houston last fall, but Afips said it could not be determined whether the economy or the location (a first for the Southwest) precipitated the decrease.

The drop this spring, with the show back at the "standard" site, was blamed on the economy.

Afips said most of the firms which either did not show or dropped out of SJCC did indicate a desire to exhibit at future conferences, with most of them indicating they would take a gamble on Las Vegas.

Bema Staff Cuts Not in DP

WASHINGTON, D.C. — The Business Equipment Manufacturers Association has been forced by economic pressures to continue to cut back its staff here and to close down its New York office, CW has learned.

The cuts have been mainly in the office equipment and office furniture areas. Nothing has happened to the computer group, whose funding remains strong, according to a spokesman for the organization. Ongoing projects, he added, such as those in the standards area, will continue.

Bema, which moved from New York City to Washington about a year ago, has cut its staff from 38 to 17 in that time.

In addition, the weekly Bema News will discontinue publishing, although in its place the organization will periodically distribute a newsletter on its activities.

Calendar

June 21-22, Chicago — Ninth Annual Conference of ACM Special Interest Group on Computer Personnel Research. Contact: Fred A. Gluckson, EDP

Systems Dept., National Bank of Detroit, Mich., 48232.

June 28-30, Atlantic City, N.J. — 8th Annual Design Automation Workshop sponsored by ACM Special Interest Group on Design Automation, IEEE, and Share. Contact: ACM, 1133 Avenue of the Americas, New York, N.Y., 10036.

July 5-7, Canterbury, England — Software 71 Conference sponsored by Software World at the University of Kent. Contact: Mrs. S. Blackman, Conference Registrar, Software World, Morley House, Holborn Viaduct, London, E.C.1, England.

July 19-21, Boston — 1971 Summer Computer Simulation Conference sponsored by ACM, AIAA, AICHE, AMS, BSC, IEEE, ISA, SCI, Share. Contact: Richard Baxter, H042, Registration Chairman, Norden Division of United Aircraft Corp., Norwalk, Conn., 06856.

July 19-23, Dekalb, Ill. — Computers in Chemical Education and Research Conference sponsored by the ACS Division of Chemical Education, the Division of Chemistry and Chemical Technology, National Research Council and the Department of Chemistry at Northern Illinois University. Contact: Dr. F.M. Miller, Department of Chemistry, Northern Illinois University, Dekalb, Ill., 60115.

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Random Notes

Communications Executive Extends DEC Unbundling

MAYNARD, Mass. — DEC's announcement of the Comtex-11 package with a price tag of \$2,500 apparently continues a limited unbundling process by the firm.

Comtex-11 is a three-module communications executive that permits PDP-11 users to change line controllers and terminals without extensive re-writing.

Unbundling will probably be limited to special applications packages at first, a DEC spokesman said. Previously the firm offered packages for such special purposes as typesetting and gas chromatography at separate prices.

Capex Optimizer Improves ANS Cobol Object Coding

PHOENIX — ANS Cobol programs can be made more efficient by using the Optimizer post-compiler package from Capex Corp. Previously available for use with Cobol F programs, Optimizer will now make ANS Cobol programs more conservative in core usage or faster in execution time, the firm said.

The improvement desired is user-defined. The Optimizer scans the object program and strips unused Cobol-generated code. It also reorganizes code sequences to improve program performance. Capex Corp. is at 2613 North Third Street, 85004.

Newspaper Offers Subscription, CRT Inquiry Software to Others

JACKSONVILLE, Fla. — Newspapers can improve processing of subscriber billing and customer service inquiries with software from the Florida Times Union. One routine provides direct subscriber billing to simplify conventional 'paid-in-advance' systems. The other permits CRT operators to inquire against on-line files using customer names or the phonetic equivalents.

The routines have been implemented on an IBM 360/30 with Bunker Ramo CRTs and 2314 disk units. They are available without cost to other newspapers, according to a Florida Times Union spokesman from 1 Riverside Ave., 32201.

Seminar Teaches Systems Work

COLORADO SPRINGS, Colo. — Managers who need to brush up on systems fundamentals and newcomers to the field can get five days of systems analysis and design practice through the Fast Start seminars of Systemation Inc.

The seminar-workshop troubleshoots a simulated organization that has systems deficiencies. Given in various cities across the country, Fast Start costs \$395. The firm can be reached through P.O. Box 730, 80901.

Boeing Adds Interactive 'Cogo'

SEATTLE, Wash. — Land developers can examine various ways of subdividing a tract into lots that meet local zoning and building requirements with the interactive graphic Coordinate Geometry (Cogo) system on the Boeing Computer Services Inc. time-sharing network.

The system allows a developer to subdivide land faster with the most efficient utilization, Boeing said. Cogo is available via dial-up lines across the country. The firm is at P.O. Box 24346, 98124.

'Pi Fort' Puts ANS Fortran on S/3

By Don Leavitt
CW Staff Writer

LOS ANGELES — Engineers and other scientific users with access to an IBM S/3 can use the machine for Fortran programming with the Ansi-level compiler, called Pi Fort, from Programmatic Inc. (PI).

Pi Fort is immediately available, while IBM has scheduled a Fortran IV compiler for the 3/10, for delivery in third quarter, 1972.

The Programmatic package requires only 12K bytes of memory but will use more if available. The IBM Fortran IV is

expected to have similar core requirements.

Programs generated by Pi Fort are said to be extremely fast, even under heavy computational loads. The execution speed is possible primarily because Pi Fort is not an interpretive processor, PI said. The package produces machine-level object code that is used directly at run time.

Pi Fort goes beyond the standards set by Ansi. It provides extended forms of formatting, including the use of literals in data FORMAT statements, a spokesman said. Variables may be entered singly and need not be grouped into lists. Beyond that, Pi Fort has no initialization routines for variables and this provides a substantial core savings, he noted.

The Programmatic package provides for mixed mode arithmetic, and real numbers and integers are supported, the company said. Pi Fort supports all IBM devices that can be used with the S/3. Unlike the announced Fortran compiler from IBM, Pi Fort does not require a disk.

Pi Fort is available on lease at \$100/mo from PI at 11661 San Vicente Blvd., 90049. IBM has said that its Fortran IV compiler will be similarly priced.

Flexible Receivable Processing Key Feature of Fortex Package

CHICAGO — The Accounts Receivable/Customer Information System (Arcis) from Fortex Corp. is said to be more flexible than most accounting packages. It supports multiple types of accounting processing while producing standardized reports and/or providing means of developing new ones.

While some accounts receivable systems allow the user to apply different processing methods on a per account basis, Arcis is said to permit balance forward, open item, installment, and deferred or postdated receivable obligations for the same account.

The customer information data base built up by Arcis is said to contain a significant amount of historical and budgeted information for sales analysis and credit and collection processing. In this way, reports are generated to support the detailed customer statements produced by the receivables processing.

Reports can be produced by branch

office, district, division, regions, or corporate level of operation, and several levels can be generated within a single run of the program, Fortex said.

Details of reports are specified by the user at execution time. This permits the user to develop new reports for one-time use or regular production.

Arcis is written in ANS Cobol for ease in user modification and implementation on a variety of systems. It has been used on an IBM 360/30 or similar CPU, with 44K bytes of storage, one disk pack and three other peripheral units, either tape or disk.

The \$10,000 system is available from 230 N. Michigan Ave., 60601.

Print Spooler From Boothe Bows

LOS ANGELES — IBM 360/30 users operating under DOS can increase throughput by as much as 40% by using the Spooler Software Package (SSP), according to the developer, Boothe Resources International (BRI).

The Boothe spooler has been developed to drive a printer from a foreground partition while it spools the backlogging output onto a disk at many times the speed of the printer. The output is moved to the printer as the unit becomes free.

Similar packages provide spooling for card reading and punching as well as printing.

By working with just the printer output, the SSP is able to operate in less than 4K bytes of core, including a sys-

tem of double buffers to keep the printer going at full speed.

The SSP includes techniques for handling priority print jobs and restart procedures in case of machine failure. When a priority job is entered, the printing then underway continues to a page break. At that point the critical job assumes control of the printer and the output for the previous job is diverted to the disk.

The package's ability to detect a page break is the key to its restart procedure as well. The operator is able in effect to leaf through the disk file until he finds the page on which the failure occurred.

The spooler can be purchased for \$3,500 or leased for \$195/mo from Boothe at 3435 Wilshire Blvd., 90005.

'Info-Tem' Handles General Ledger Work

FOREST HILLS, N.Y. — With or without an in-house computer, users are able to automate general ledger applications with the Info-tem information retrieval system from Omnibus Computer Systems Corp. (OCS). The company will assist users without a CPU in obtaining time elsewhere.

The system is said to produce balance sheets, profit and loss statements and condensed comparative statements. With Info-tem, users can compare current year to last year figures, or budget to actual expenses. Budget variances are analyzed, OCS said, and the system also reports current period and year-to-date information.

Info-tem provides zero balance editing of entry data which may be coded to reflect any chart of accounts the user wishes. The entry items are automatically carried over into the general ledger file. The history file is kept current by maintenance programs, which resolve any incompatibilities that occur, according to Omnibus.

OCS said it would assist users in interfacing existing systems with Info-tem, without cost to the user. The system includes 11 programs written in Cobol and has been implemented on an IBM 360/25 with 32K bytes of core. Supporting peripherals may be either disks or tapes, the company said.

The system may be purchased for \$16,000, but individual modules are available from 67-35 Yellowstone Blvd., 11375.

'Iras' Builds On-Line Jobs

RIDGEWOOD, N.J. — The Immediate Response Application System (Iras) from Computer Covenant Corp. (CCC) is a generalized multi-terminal, on-line package that can be tailored to the user's specific application.

Iras is particularly suited to users who require a match-up between customers and inventory.

Written in Extended Basic, Iras can handle inventory control, order processing, reservations, material handling, and point-of-sale operations.

Iras can be used on small systems dedicated to a given application, or larger time-sharing systems.

Turnkey versions of Iras, including terminals, CPU, the Iras software and CCC support are available for "under \$3,000/mq."

Computer Covenant Corp. is at 1156 E. Ridgewood Ave., 07451. -30-

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NO UPDATE
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READY
RECORD < 16
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STAT NOT I
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We built these messages into the INFOREX Intelligent Key Entry™ System because we believe a truly responsive system can significantly cut data entry errors and simultaneously increase data throughput. For example:

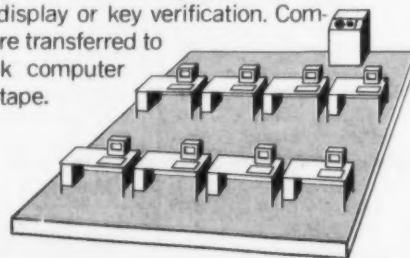
Our 125-character display screen does a lot more than provide a visual check on the operator's work. If she makes an error in procedure it tells her exactly what is wrong. Gives her the status of the job at any time. Issues instructions. Lets her resume work quickly and accurately after an interruption.

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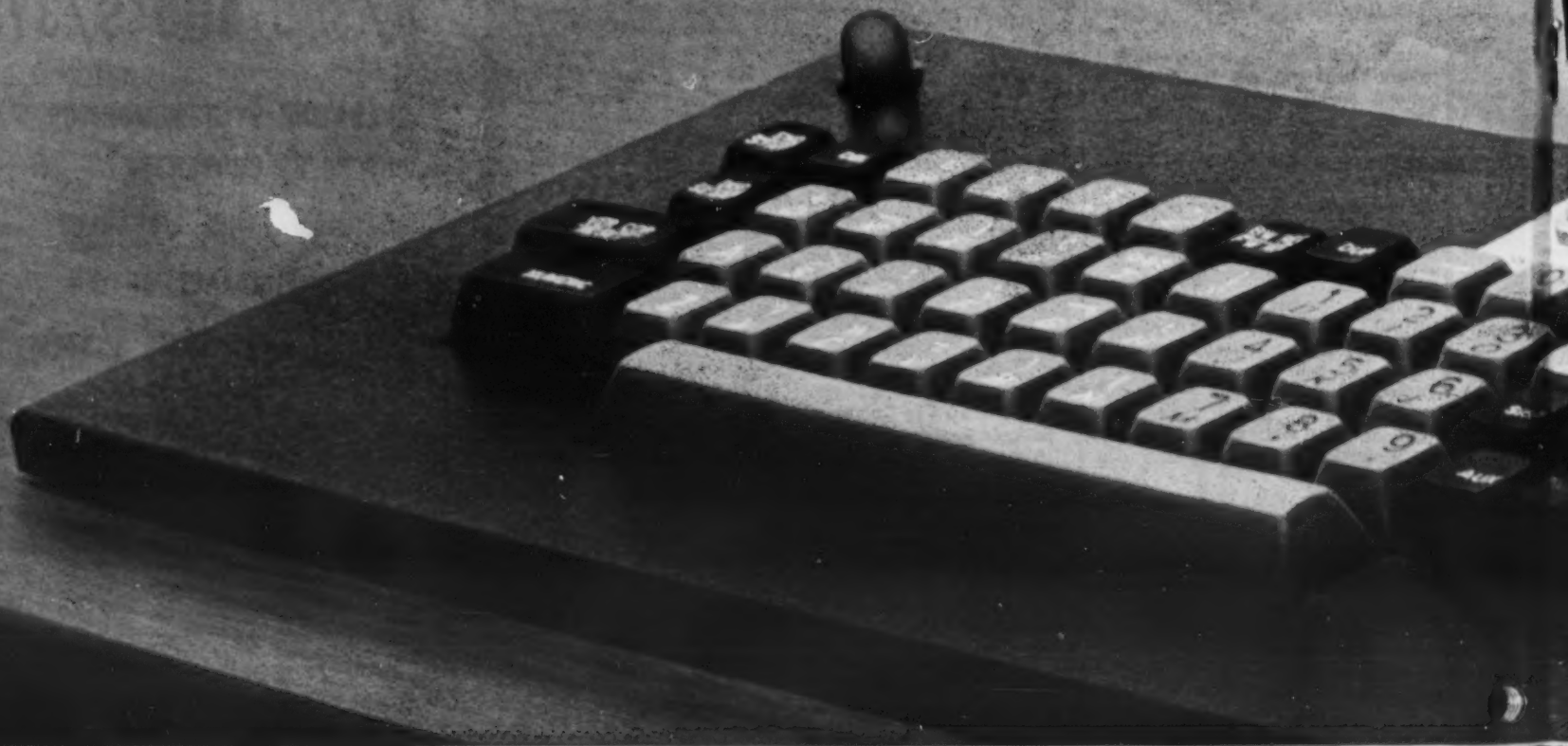
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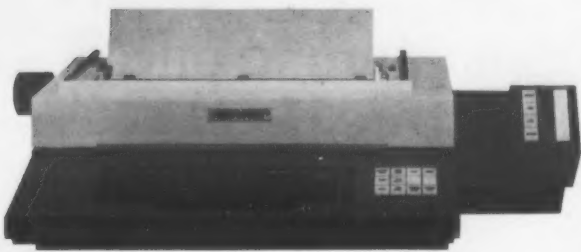
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'LSC' Generates Simple RPG Programs

HAZEL CREST, Ill. — Source decks for simple RPG programs on the IBM S/3 or 360 can be prepared, without coding all the specification sheets normally required, by using the List/Source Compiler (LSC) package from Information Processing and Consulting (Ipac).

LSC generates code only for punched card input and provides no tests for selection of valid or rejection of invalid cards.

The source programs generated by LSC basically are capable of listing and/or accumulating totals from whatever cards are handled.

The choice of source code as output of LSC allows users to

add standard RPG coding to the deck, before compiling, to take advantage of capabilities not available through LSC, Ipac said.

Features such as comparisons, zero-and-add, and table lookup can be added to the LSC-generated deck. This gives users the flexibility they would have with conventional RPG coding.

The LSC coding is developed in three card formats, laid out on a single sheet so users don't have to keep track of four or five different specification sheets.

An LSC control card defines the spacing, horizontal and vertical, of the report to be generated and a header card provides the report title to be printed.

The third LSC card allows the user to define the fields on the input data card and the types of operation to be performed, which are limited to add, subtract and print. The print facility includes automatic editing similar to that of the 360/20 multiple utility program.

Currently there are three versions of LSC, suitable for use on the 3/10, the IBM 360/20, and larger 360s operating under DOS. Versions for the 3/6 and the IBM 1130 are now under development.

LSC requires 8K bytes of storage on either the S/3 or the 360. The package costs \$250 from Ipac at P.O. Box 56, 60429.

'Precis' Aids On-Line File Inquiry, Update

CHICAGO — Operators working with IBM 2260 CRT terminals can retrieve information from on-line files by entering the request with an approximate spelling of the subject name, using the Phonetic Reference Exact Code Index System (Precis) from CNA Insurance.

Inquiries and updating entries from the terminals can be based on subject account number or similar precise identifier, but the acceptability of phonetic

names is the feature that really makes Precis worthwhile, the company said.

The package strips all vowels from the name as entered and compares the results to names from the field, similarly stripped. Only matches are reported.

Currently in development is a version that will allow the operator to determine how close the spelling is to the real name. Working with this data, Precis will provide all names that fall within specified percent of accuracy.

In addition to answering inquiries, Precis posts updating requests to a magnetic tape file for later batch processing, and prints error listing and audit and control figures for management review.

view.

As used by CNA, Precis works in conjunction with on-line master files for insurance applications that are supported by CNA's system for personal insurance information bases, called Sahib.

Written largely in Cobol, with some Assembly Language subroutines, the full Precis requires 134K bytes of core with overlays. It is modular, however, and can be run in less core if some of the features are omitted, according to the company.

The system is available for \$20,000 which includes two man-days of on-site support for training and or implementation.

CNA is at 310 So. Michigan Ave., 60604.

'Alps' Writes Personal Letters From Paragraphs Stored on Disk

SPRINGFIELD, Ill. — A virtually unlimited number of different letters with variable personalized inserts can be printed with the Automated Letter Preparation System (Alps), according to Franklin Data Services Corp. Alps is available as a service or in-house package.

Alps provides a disk-resident library of basic letters, with text, paragraphing and location of possible inserts designated by the user.

The library also enables the user to store independent paragraphs which he is free to put together in any sequence to form a letter.

Against this library, the user may enter input data from terminals, CRTs, cards, or magnetic or paper tape.

The system can also be used to print mailing addresses on continuous-form envelopes or self-sticking labels.

Alps operates on a 32K IBM 360 under DOS. A disk unit is required for the basic letter library; other peripherals depend upon the user's needs.

Recognizing that users have different input mode or modes, Franklin has priced the appropriate modules separately from the basic Alps package, which costs \$11,500. The modules for input, capital to lower case conversion, and billing procedures cost from \$500 to \$750. The firm is at 1 Franklin Square, 62705.

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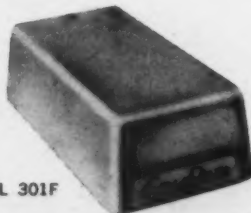
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Bits & Pieces

Printouts Reduced in Size, Copied With A-M System

CLEVELAND, Ohio — The 2850 Continuous Total Copy System from Addressograph-Multigraph combines the Multilith Offset 2850 duplicator with an A-M 2300 electrostatic copier, and allows computer printouts to be reduced in size, made into multilith masters and printed on bond paper for mass distribution.

The 2300 copiers have been available for some time. The 2850 duplicator costs \$9,994, the firm said from 1200 Babbitt Road, 44117.

Device Reads Badges, Prints Time Clock Punch-In Records

MAMARONECK, N.Y. — A 10 by 10 Sealectrocard Badge Reader, developed by Sealectro Corp., which will read standard Hollerith, decimal and binary codes, provides DP interface capability for self-contained time clock stations.

Working in conjunction with customer furnished clock and logic circuitry the 1012 reader handles standard 10 or 12 digit plastic ID badges, locking out improperly coded ones. The system drives a 14-digit hard-copy printout which records employee number and time of punch-in. Sealectro Corp. is at 225 Hoyt St., 10543.

Ledger Cards Use Mag Tape

PARAMUS, N.J. — By bonding conventional magnetic tape to ledger cards and then treating the tape with a non-silicone formula to resist abrasions, Systematic Business Forms has developed a magnetic ledger card that will retain uniform signal strength.

The Magnetape system has been used in cards for Burroughs, NCR and Phillips accounting systems, and could be used for any comparable applications, the company said from 365 State Highway Route 17, 07652.

Memorex Adds Printer Ribbons

SANTA CLARA, Calif. — Memorex Corp. has a new line of DP ribbons fully compatible with IBM 1403 printer; and Honeywell, CDC, GE, Burroughs, Univac, NCR and RCA printers.

Gates Silences Friden Units

SANTA ROSA, Calif. — A silencing enclosure for Friden devices, the 175T series from Gates Acoustinet, is said to be from three to four times more effective acoustically than previously available units.

The cabinets can be opened partially for typing, or fully for forms changing. The units cost \$379 or \$439 from the firm at P.O. Box 1406, 95403.

Calcomp Adds 2314-Type Disk to 1130

By Ronald A. Frank

CW Technical News Editor

ANAHEIM, Calif. — IBM 1130 users now have a plug-compatible 2314-type disk system from California Computer Products Inc. (Calcomp) to upgrade their storage capability.

Designated the DS12 system by Calcomp, the drive is a modification of the earlier CD 12 system and incorporates all electronics including controller and 1130 interface into one unit, a spokesman said.

Uses Disk Monitor

The DS12 is interchangeable and program compatible with all IBM 1130 disk system configurations using the Disk Monitor System, Version 2. The system can store a total of 10.2 M 16-bit words on each interchangeable disk pack, with 2.5 M words under monitor control at any given time. The average access time of the DS12 is 35 msec.

With the DS12, information may be stored in either the internal 1130 disk or on the DS12. Utilization of the 1130 disk (512K words of information) allows the DS12 to provide four complete storage segments, each with two million words. Each segment is switch selectable and

transparent to existing IBM Monitor-II software, the firm said.

Purchase price of the DS12 system is \$24,000, with lease rates of \$600/mo. Maintenance costs add about \$140/mo. The DS12 is available for delivery in 60 days from 2411 West La Palma, 92801.

Mohawk Terminal Replaces 2780

HERKIMER, N.Y. — Mohawk Data Sciences' 7208 remote batch terminal is compatible with the IBM 2780-BSC; the CDC 200; and the Univac 1004; and DCT 2000. Monthly rental and maintenance on the 7208 is about 20% less than the IBM unit, Mohawk said.

Compatibility with any of the four units is said to be user-selected with a fast card load run. The 7208 can also communicate with Mohawk's 2400 peripheral processing system.

Normal configuration of the terminal includes a controller, a 400 card/min reader, a 300 line/min printer (132-column standard), and a dial-up synchronous communications capability at 1,200 to 3,600 bit/sec.

When operating in the IBM 2780 mode, the Mohawk 7208 offers multiple record transmission, EBCDIC transparency, and automatic answer. When operating in CDC 200 mode, the 7208, at additional cost, includes a KSR33 Teletype for operator control. A synchronous communications capability at 2,400 to 4,800 bit/sec is optional.

Rental is \$860/mo including maintenance, on a one-year lease. Five year lease rates can be as low as \$757/mo, Mohawk said. Purchase price is \$34,400, with first delivery in July.

Key Entry System Includes CPU

By Michael Merritt

CW Staff Writer

LOS ANGELES — Computer Machinery Corp. has introduced a scaled-down version of its Keyprocessing key entry system called the CMC 5. The system includes from one to twelve \$70/mo input stations, and a \$570/mo supervisory console including maintenance.

The CMC 5 key-entry stations are connected to the supervisory console that houses a general-purpose CPU, a magnetic tape unit and a disk file. The system can include an ASR 33 Teletype and a CMC 761 line printer.

Data, entered at each station, is processed by the console CPU and recorded on the disk. Verified data is transferred in batches to magnetic tape in "any standard tape code." The output can then be processed by a larger CPU.

When used in a remote location, the CMC 5 can send and receive data via common carrier data-sets at up to 2,000 bit/sec without disrupting keying operations.

Operators can work in the same or different modes on a variety of jobs using various data formats. Data keyed from source documents in logical sequence can be reformatted during disk-to-tape transfer to conform to user-defined requirements.

All operator assignments except those requiring the use of the keyboard are said to have been eliminated on the CMC 5.

The CMC 5 is hardware- and software-compatible with the earlier CMC 7 and CMC 9 systems.

A CMC 5 key processing system with supervisory console, six stations and an independent supervisory teleprinter leases

for \$990/mo. First deliveries are scheduled for fourth quarter 1971, from 2231 Barrington Ave., 90064.

Mini POS Terminal Is Portable

PALO ALTO, Calif. — Retail clerks will be able to record a customer's selections electronically and then enter the accumulated data into a point-of-sale terminal, with the Mini-Register being developed by Transaction Systems Inc. (TSI).

Intended as part of a total point-of-sale system, the Mini-Register will be a portable unit about the size of a transistor radio. It includes a data-wand, five panel command strips, an IC memory and indicator lights, allowing it to accept and store transaction data.

With the data-wand, the clerk scans her employee ID badge, up to 10 merchandise tickets, the customer's charge card and the type of sale. These may be scanned in any sequence.

Data from the Mini-Register is transferred to a larger point-of-sale register, which signals if any data has been omitted. The larger register completes the sale by verifying credit, computing taxes, printing an alphabetic sales slip and recording transaction data on magnetic tape.

The larger register can support two Mini-Registers in addition to recording data directly through its own data-wand. Users effectively have three registers available to them with such a configuration.

The changeable command strips will allow the Mini-Register to be used for other applications such as inventory of

stock.

The Mini-Registers are expected to sell for approximately \$600 each and be available in about a year. A prototype, about the size of a cigar box, has been demonstrated, the company said from 490 San Antonio Road, 94306.

IBM Lists Peripherals

WHITE PLAINS, N.Y. — Clarification by IBM shows that the recently announced peripheral price cuts [CW, June 2] also apply to drum, fixed head storage and data cell units in addition to the disk, tape and printing units.

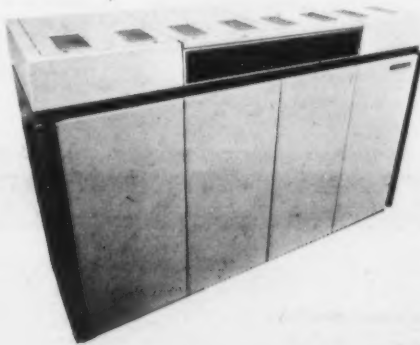
The complete list of affected products provided by IBM includes:

- Disk units 2311, 2312, 2313, 2314, 2318, 2319, 2841 and 2844.
- Tape units: 729, 2401, 2402, 2403, 2415, 2420, 2803, 2804, 2816, 3420, and 3803.
- Printers: 1403, 1443, 1446, 2203, and 2821.
- Drums and fixed head storage: 2301, 2303, 2305, 2820 and 2835.
- Data cell: 2321.
- 370 peripherals — not yet available: 3211 printer and 3811 control unit; 3330 disk unit and 3830 control unit.

Mixed Marriage Works!

The Data Products LARGE CORE STORE and the IBM 360 Computer have been wed. The 360, formerly exclusively engaged to the IBM 2361, couldn't resist the beauty of Large Core Store with four times faster operation at lower cost.

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Voice Response System Uses Computer TTY Port

SAN DIEGO, Calif. — The Digitalk 4000 Voice Response System from Metrolab, Inc., a subsidiary of Cubic Corp., can be connected to any computer with a Teletype port.

The low-priced device uses a Touch-Tone-type telephone pad as input and responds with a vocabulary of up to 63 words or phrases.

The device is equipped with necessary modems, interfaces, buffer storage and a standard vocabulary of 36 words. The vocabulary is field-expandable with an additional 27 words or phrases in a matter of minutes.

The device uses a rotating analog drum with a maximum ac-

cess time of 1/2 second to a message of up to 32 words. Changes in vocabulary, the company said, are accomplished on a drum exchange basis. The user can replace the drum himself in 15 minutes, the company said.

The modifications to the memory can be supplied to Metrolab in either text or recorded tape form. After the vocabulary is recorded on the drum, a tape is made for customer approval.

The Digitalk 4000 requires no changes to Teletype-compatible software. The low cost of the unit is said to be based on the system's single-phase-line capability.

The system costs \$5,000, on a 90-day delivery from 9233 Balboa Ave., 92123.

Monitor Senses Alarm Conditions

EAST RUTHERFORD, N.J. — A security monitoring system that is said to be suited to computer room requirements, the Model 400C Digitor Security Monitor, can detect fire, intrusion and other alarm conditions.

As many as 1,000 sensors can be monitored through a single Digitor, the company said.

The system is built around a hardwired processor with sufficient capacity to accommodate a maximum Digitor system.

The Digitor provides a patented time division multiplexing system which permits all points to be monitored by a single operator.

The Monitor console unit includes a clock printer to record all transactions, a channel status panel containing a three-position switch for each channel, a multiplex control panel, and a charger inverter that supplies an uninterrupted source of power to the console in the event of power-line failure.

The Monitor unit, including one status panel, is priced at

\$27,000. Additional panels will cost \$4,350. A transponder is priced at \$195. An average system, the company said, capable of monitoring 100 points, is priced at about \$30,000 on a 15-day delivery from East Union Ave., 07073.

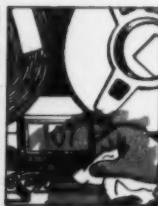
Digitizer Allows Choice of Output

ROCKVILLE, Md. — A graphics digitizer from the Peripheral Systems Division of Computer Equipment Corp. has no moving parts and offers the user a choice of output media.

The off-line device features a solid-state grid table with a tiltable 42 in. by 60 in. work area. Accurate reduction of graphic data into digital form with a resolution of .001 in. at tracing speeds to 300 in./sec are produced.

Prices range from \$13,750 to \$24,840, including software. Delivery is 45 to 90 days from 14616 Southlawn Lane, 20850.

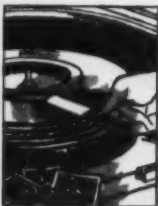
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Interference Affects Specialized Carriers

By Ronald A. Frank

CW Technical News Editor

WASHINGTON, D.C. — The recent FCC decision allowing competitive microwave services among the existing and new specialized common carriers apparently did little to resolve the associated frequency interference problems.

Negotiations to dispose of these problems could delay FCC approval for many of the specialized carriers, thereby postponing service to data and other users.

Each application for a microwave site is analyzed by AT&T and other carriers for possible interference with similar existing or planned transmission paths.

One of the largest interference study groups is operated by AT&T for the Bell System companies. Using a 360/65 with a data base containing specifications on all transmission paths, the group is working full time with the specialized carriers on interference problems.

"I know of no specialized carrier that we have cleared out 100%," an AT&T spokesman told CW. He added that the carrier is making every effort to expedite the handling of the problems.

The specialized carrier that seems to be closest to eliminating its technical problems is Interdata Communications, Inc., a Microwave Communications of American (Micom) affiliate that will provide service between New York and Washington.

Apparently the only technical problem standing between Interdata and FCC approval is a change in the type of antennas

proposed for some of its sites. Barring any unexpected problems the Interdata link could get its construction permits by July, an FCC staff member told CW.

One firm specializing in analyzing frequency problems is Compucon Inc. in Dallas. The company has conducted studies for Data Transmission Co. (Datan), Micom affiliates and others.

Communications

AT&T will have to file interference objections "to protect their interests," according to John Israel, Compucon president. But these objections should not unduly delay FCC approval of the

applications, Israel said.

Among the interference criteria considered by Compucon and AT&T are frequency separation, and distance separation from nearby sites. After possible interference arises, the affected carriers usually negotiate a solution among themselves. This may mean moving the site location or modifying the microwave equipment.

Once a solution has been agreed upon, letters with the details are filed with the FCC. Normally, interference problems are resolved outside of the commission on a technical level, according to an FCC staff member.

Compucon maintains a data base of microwave site specifications on an 1130 in addition to utilizing a time-shared service for backup when required.

'Netset' Improves Data Nets

By Don Leavitt

CW Staff Writer

BRAINTREE, Mass. — Users don't have to hire communications consultants to optimize their telephone network loads and costs, with the Netset analysis service developed by Digital Systems Corp., Hanover, N.H., and available on the Interactive Sciences Corp. time-sharing system.

Both voice and data communications networks of any size may be analyzed. Direct wire, time-division multiplexing, frequency-division multiplexing and multiple Wats networks can all be studied, ISC said. All types of line conditioning can be considered by Netset.

The service utilizes a number of large data bases and does not require excessive technical data.

Using Netset, the communications designer may reduce excess capabilities, reroute paths for special considerations, optimize line loadings for a desired response time and test each change for effective cost considerations.

Netset is available on a local dial-up lines to ISC offices in Braintree, New York, and Pittsburgh. ISC normally charges \$7.50/hr for connect time, one cent/interacton (a measure similar to GE's computer resource unit), and \$1/mo for 3.2K words of storage. There is a 65% surcharge on the interacton fee for Netset, ISC said from 60 Brooks Drive, 02184.

Data Briefs

FCC Okays Microwave Link to WU DP Center

WASHINGTON, D.C. — The FCC has authorized construction of a 30-mile microwave link to tie a Western Union computer center into the carrier's transcontinental network. The center, in Middletown, Va., will be one of WU's major switching facilities.

The new link can provide for either 1,200 voice grade channels, or 600 channels plus a 6.3 Mbit digital capacity. At first 144 voice-grade channels will be equipped, the company said, and will tie into three Univac 1108 and three Univac 418-III systems.

Timeplex Unit Controls CPU Telephone Polling

NORWOOD, N.J. — The Timeplex Computer Calling Unit (CCU) enables a computer to access telephone numbers including PBX outside line prefixes from a standard RS232 low-speed I/O channel.

Available in dial pulse and Touch-Tone models, the unit can decode serial dial digits in Ascii, IBM or Baudot at rates from 20 to 4,800 bit/sec. The \$750 units are available from Timeplex at 65 Oak St., 07648.

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On the hardware side, RSTS-11 lets any terminal access line printers, card readers, DECtapes and small or large disk files. It will take on up to 16 terminals, each with a capacity of up to 16,000 bytes of memory and the ability to open 12 data files at once. And it will take on fixed or removable disks and industry-compatible magtape any time you're ready.

Yet with all this power and versatility, RSTS-11 can be delivered, ready to interface with your teleprinters, typewriters or CRT's, for under \$50K.

That's far less than similar HP and Honeywell systems.

And only RSTS-11 has BASIC-PLUS.

Write for more information. Digital Equipment Corporation, Main Street, Maynard, Massachusetts 01754, (617) 897-5111.

digital

Justice System May Ease Court Backlog

By Cornelia M. Parkinson

Special to Computerworld
CINCINNATI — Hamilton County's Criminal Justice Information System (CJIS), now being programmed to become operational next January, will keep tabs on a person from the time of his arrest until he leaves the jurisdiction of the county.

By entering his records into computerized files and utilizing these records at every step in due process of law, the system is expected to provide swifter, surer and less costly legal procedures.

A subsystem of the county-wide Clear (Computerized Law Enforcement Applied Regionally), CJIS will be based on the presently operating Criminal History File. Anyone arrested within the county is entered into this file.

After preliminary checking for previous record, each person is given a permanent control number which pertains to his record only. Data obtained from the suspect, and through links with other computerized law enforce-

ment agencies in the state, other states and the FBI will show the Social Security number, all statistical information on the driver's license, plus any state-reported traffic violations, any arrests, convictions and sentences.

This data will be used in basing bond amounts — or refusing bond — and preparing daily court dockets. With present court procedures and insufficient personnel, sometimes case loads are so high that not all accused persons' records can be checked for prior court contacts. Under CJIS an automatic search will be made and a "rap sheet" prepared for the prosecuting attorney during the trial and the judge before pronouncing sentence.

Though a previous criminal record cannot be used for determining guilt or innocence in a current offense, it is taken into account in sentencing.

An RCA Spectra 70/60 operates the entire Clear system. Two RCA 70/45s provide back-up; in April one will be replaced by a 70/60. Terminals presently

in use total 95, with 22 RCA 70/752 Video Data Terminals, 35 automatic send/receive ASR-35 teletypewriters and 38 receive-only RO-28 teletypewriter terminals.

Instant access is provided to police records for each of the county's 42 law enforcement agencies, including all police departments, the municipal court bailiff's office, and the regional FBI Office and Department of Alcohol, Firearms and Tobacco.

By next January, terminals will have been added to all agencies involved in processing an offender: the clerk of court's office, the prosecutors' offices, courtrooms, probation offices, the jail, the workhouse and the office of the assignment commissioner, who sets trials dates and assigns judges.

Aspects of the Criminal History File which have proved most valuable to date are stolen vehicle records, and the wanted files which officials say have "worked out fantastically." Whenever receiving a warrant on a person, or arresting someone, the Hamilton County Bailiff checks whether the person is wanted for other offenses. One month he averaged one such "hit" per day. The wanted file is also checked whenever a convicted felon registers under the city's Felon Registration Law.

Approximately 70,000 individuals' records from Cincinnati alone are now being coded and entered into the computer as rapidly as possible. This backlog information is minimal, but should any person whose history is now on file come before the court, additional information on him would be obtained.

By making comprehensive information readily accessible and automatically presented in usable form to the needing agency, CJIS will free recordkeeping and clerical personnel for more important duties, and enable far reaching decisions to be made not only on a legal basis, but also on the facts of the individual's performance.

WHAT'S AHEAD for the computer industry in the 1970's, as the recession draws to an end?

HOW WILL the main-frame builders fare? The independent peripheral makers? The crowded service and software industry?

THE PROSPECTS are outlined in the "Gray Sheet's" Annual Review & Forecast Issue... covering all industry segments. Send \$10 for the issue, or \$75 for a 24-issue subscription including the annual review.

EDP industry report

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The Machine Decides

Experiments designed to give the computer some of the sensory abilities of humans are being conducted at MIT using a data tablet manufactured by GTE Sylvania Inc., a subsidiary of General Telephone & Electronics Corp. The data tablet transmits material drawn on its face to a computer, and assists in experiments designed to add touch and sight to the computer's senses. An MIT research assistant makes a rough sketch on the data tab-

let, which transmits material drawn on its face to a computer. Instead of reproducing the sketch with all its imperfections, the computer interprets the intentions of the research assistant, and displays what is meant. Together with the data tablet, the experiment employs two minicomputers and a display tube. Drawings that have been placed in the computer's memory through the data tablet can be immediately displayed.

Model 33ASR with dataphone and complete maintenance service for \$74 per month.



RCA opens new line of Teletype

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- ATLANTA, GA. 30318, 1778 Marietta Blvd., N.W., Phone: (404) 355-6110
- CLEVELAND, OHIO 44142, 5121 W. 161st Street, Phone: (216) 267-2725
- JERSEY CITY, N.J. 07305, Liberty Industrial Park, 43 Edward J. Hart Rd., Phone: (201) 434-0003 (N.J.), (212) 732-9494 (N.Y.)
- SKOKIE, ILL. 60076, 7620 Gross Point Road, Phone: (312) 965-7550
- DALLAS, TEXAS 75207, 2711 Irving Blvd., Phone: (214) ME 1-8770
- MONTEBELLO, CALIF. 90640, 1501 Beach Street, Phone: (213) 685-3069

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NOTICE OF SALE OF ASSETS

TO CREDITORS AND OTHER INTERESTED PARTIES:

NOTICE IS HEREBY GIVEN, that a hearing will be held before the undersigned Referee in Bankruptcy in Room 234, United States Court House, Foley Square, New York, New York, on the 28th day of June, 1971, at 10 o'clock in the forenoon of that day, at which time and place this Court will consider the application of David P. Alterbaum, as Trustee of the Estate of Computer Applications Incorporated, Bankrupt, for authority to offer for sale the equipment described below and located on the premises of L.M. Rosenthal & Company, Inc., 5 Hanover Square, New York, New York, and Dubner Computer Systems, Inc., 572 Madison Avenue, New York, New York, pursuant to a written offer therefor for \$15,000.00, payable in cash, or to any person making a better or higher bid as may be approved by the Court and subject to such terms and conditions as may be approved by the Court and announced at said hearing.

NOTICE IS FURTHER GIVEN, that in the event the aforementioned application is granted, a hearing shall be held at the same date, time and place at which the Trustee shall offer for sale said assets, free and clear of any and all liens and encumbrances, such liens and encumbrances, if valid, to be transferred, affixed and attached to the proceeds of sale.

NOTICE IS FURTHER GIVEN, that the aforesaid assets belonging to the bankrupt estate shall be sold to the person or persons making the highest or best offer which is approved by this Court; provided, however, that the Court may reject any and all bids. Any sale or sales shall be without representations and warranties whatsoever and without recourse in any manner against the Trustee, except that Digital Equipment Corporation ("DEC") has undertaken to maintain DEC-manufactured equipment after completion of repairs and systems checks estimated by DEC to cost \$4,350.00. All offers must be accompanied by a 10% deposit payable in cash or by certified check or such other deposit as may be approved by the Court.

HIGHER BIDS OR OFFERS TO PURCHASE THE AFORESAID ASSETS ARE INVITED. If a higher or better offer shall be received at the aforesaid hearing with a 10% down payment, in cash or by certified check or by such other deposit as may be approved by the Court, such higher or better offer, if approved by the Court, shall be accepted and the offer described above shall be rejected by the Court, which shall authorize the Trustee to enter into a contract of sale with reference to the higher or better offer which contract need not be approved by the Court.

NOTICE IS FURTHER GIVEN, that the aforesaid assets shall be available for inspection by appointment.

NOTICE IS FURTHER GIVEN, that the hearing at which the said assets shall be offered for sale may be adjourned from time to time without notice to the bankrupt, creditors or other parties in interest other than the announcement of the adjourned date or dates at such hearing.

Further information may be obtained from David P. Alterbaum, Esq., 116 John Street, New York, New York 10038 — (212) 964-8040, and Well, Gotshal & Manges, Esqs., 767 Fifth Avenue, New York, New York 10022 — (212) 758-7800, attention Chester B. Solomon, Esq.

Dated: New York, New York
June 16, 1971

Asa S. Herzog
REFeree IN BANKRUPTCY

LIST OF COMPUTER AND OTHER EQUIPMENT

- | | |
|---------------------------------------|---|
| 1 DEC PDP 8/I-C-Computer and KSR 35 | 1 DEC 645 Anelex Line Printer 300 L/Min Plus Line Printer Control |
| 1 DEC MC 8/I — Ext. Mem 8 4096 Words | 6 RO 35 Teletype Write Only Machines |
| 1 DEC MM 8/I — Ext. Mem 8 4096 Words | 1 STR/1 CAI Terminal K.B. 8 T.T.V. Controller |
| 1 DEC PC 8/I High Speed Reader/Punch | 4 STR/2 CAI Keyboard Terminals |
| 1 DEC DM01 Data Channel Multiplexor | 1 STR/3 CAI Display System Interface |
| 1 DEC TC 01 Dectape Control | 5 Sanders CRT Display Units |
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Additional equipment and property belonging to the bankrupt estate located on the premises of L.M. Rosenthal & Company, Inc., 5 Hanover Square, New York, New York, and Dubner Computer Systems, Inc., 572 Madison Avenue, New York, New York.

For Law Enforcement**Oregon Follows Lead of 'Leds' Network**

SALEM, Ore. — The first phase of a statewide computerized law enforcement network, designed to minimize operator work and chance of error, has been implemented here.

Dubbed the Law Enforcement Data System (Leds), the network connects state, local and federal police agencies through direct computer-to-computer interface.

Phases two and three will pro-

vide criminal justice records and "information management," according to S.R. Mayhugh, state manager of law enforcement data systems.

The first phase has improved the communications capabilities of law enforcement agencies by replacing two separate teletype-writer systems which used Model 28 equipment with a mixture of KSR and ASR equipment, Mayhugh noted.

The Leds system uses EMR 6130 computers to interface with IBM/360 gear at various locations: a Model 65 at the FBI in Washington, a Model 40 at the Lane County Area Information Records System (Airs) in Eugene, and the 40 at the Department of Motor Vehicles here.

EMR also designed the system software, consisting of specially tailored DCS-16 software modules operating under the company's Asset real-time monitor.

In case of system malfunctions causing the system to stop, the modules automatically save all received messages and message queues.

DP May Have Its Day at the Track

CW Midwest Bureau

COLBERT, Okla. — Damon Runyon once wrote of a race track tout who could be seen, from time to time, having horses whisper in his ear. The horse was really nuzzling a lemon drop the man had in his ear, but, to the more gullible, the man was getting some inside information.

Could it be that the "lemon drop kids" of tomorrow will be touting the less aware with print-outs or remote terminals?

According to J.K. Trimble, president of the Computer Horse Breeders Association here, judging horseflesh by computer analysis removes almost all of the risk.

After seven years of research on the subject, Trimble considers the formulae and the programming "highly proprietary," but did say that balance is a determining factor for the analysis.

For breeding, a mare is measured in 18 different ways and the results are run against a data bank of 500 stallions.

Privacy Bills Opposed

WASHINGTON, D.C. — A State Department official told a House subcommittee recently that his agency opposes enactment "as presently drafted" of two bills aimed at protecting civilian employees in the government from "unwarranted governmental invasions of their privacy."

Howard P. Mace, deputy director general of the Foreign Service and director of personnel at State, said that the bills, H.R. 7199 and 7969, "completely overlook the security implication for the Department of State and other agencies involved with the national security."

'Rags' + Trash = Success?

SEATTLE — From "Rags" to riches. That's the dream of Boeing Computer Services Inc. which is marketing a series of programs designed to reduce the cost of garbage, trash and other solid-waste collections for cities and towns.

According to Boeing, the Route Analysis, Generation and Simulation (Rags) programs are the first comprehensive routing and scheduling package applied to this particular problem. Software catalogs list few, if any, others.

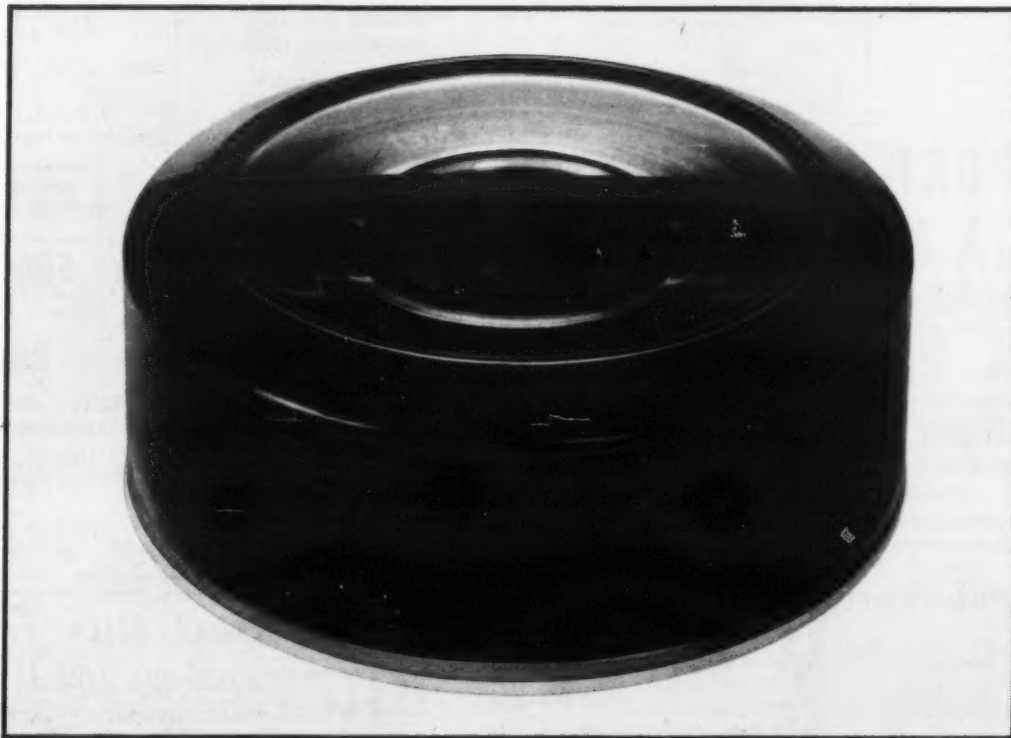
Developed by Owen and White Inc. of Baton Rouge, La., Rags plots truck routes for optimum usage, taking into account such diverse elements as union agreements on labor assignments and seasonal factors. During the autumn, Boeing noted, suburban routes may become overloaded with leaves, especially as burning bans extend across the country.

Rags can generate crew instructions for each truck and identify potentially the best transfer points, solid-waste disposal areas and locations for garaging of the trucks.

Cities using Rags have reduced costs 10% to 25% through route balancing, reduction of crew "deadheading" time, vehicle operating costs and capital investments, according to Owen and White.

Written in Fortran IV, Rags has been run on a 16K 1130 at Owens and White, and on a 360/65 at Boeing. The full package requires a Calcomp, Gerber or similar plotter.

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Honeywell Seeks Patent on CAI Program

WASHINGTON, D.C. - Honeywell's computer-assisted instruction (CAI) program is the subject of a software patent application.

The system is undergoing field testing at two school districts in Ohio, the company said. This marks Honeywell's first attempt at a software patent.

The application was filed on behalf of Roland C. Siaba, who developed the application system.

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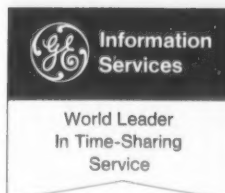
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CI Notes

Computer Exports Up 53%

WASHINGTON, D.C. — Exports of computers, parts and accessories registered a gain of 53% in 1970, according to a report issued by the U.S. Department of Commerce.

Overseas sales in 1970 totaled \$1.105 billion, \$377 million higher than the 1969 level.

Most of the computers and parts sold in Europe to the European Economic Community (\$394 million); to West Germany totaled \$176 million; and to the UK, \$170 million.

Clary Terminal Mechanical

CLARY, Calif. — Clary Data Corp., in an odd twist, has an off-tracking terminal that boasts of being mechanical rather than electronic.

Interfaceable with Clary's 404 mini-computer, the Datacomp terminal is a combination of other Clary products; keyboard, a point-of-sale register and real-time computer system. Clary claims that it has produced three million keyboards since 1946, and three sand registers. The mechanical design is cheap, reliable and well-known, according to Clary.

A subsystem with six to 10 terminals and a 4K mini, the terminals cost less than \$3,000 each, purchase, including betting software.

Wants to Improve

WASHINGTON, D.C. — The General Services Administration has awarded a \$4,400 contract to Fry Consultants of Chicago to study GSA's present processing operations and make recommendations for their improvement.

In a recent hearing before Rep. Jack Pickens' (D-Texas) House Government Activities Subcommittee, Robert L. Frig, GSA administrator, said the study would involve "alternate sources of supply, new procurements methods, firm life cycle costing, use of short-term leases, firm-term multiple leases, competitive vs. sole source determination."

Supershorts

Inter Instrument Co., Inc. will manufacture and deliver medium-speed printers to the Data Products Division of Lockheed Electronics Co. Units involved are Potter's LP Line Printers, which feature a printing speed of 135 line/min using a character set in 132 columns. The contract calls for the delivery of 100 units with an option to increase the quantity to 500 over a three-year period.

The Federal Aviation Administration purchased an additional 29 Automated Radar Terminal Systems (called ARTS III) from Univac for installation at medium activity airports around the country. The authorized funding for 29 systems is \$26,194,524. This is the third purchase under FAA's three-year contract for 64 ARTS III systems.

United Data Services Co. Inc., has formed in Phoenix, Ariz., to provide nationwide sales and service coverage to the manufacturers of data communications equipment and products.

No Licensing Agreement

Firm Sells DEC Software With Own Mini

By Edward J. Bridge
CW Staff Writer

FAIRFIELD, N.J. — A company which claims to have shipped about 100 mini-computers to former or potential customers of Digital Equipment Corp. now offers DEC software with its own mini, which it said is completely compatible with the PDP-8 series.

John Ackley, president of Digital Computer Controls, Inc., said his company's D-112 mini is intended for "sophisticated" end users in research facilities, universities or industry, as well as for the OEM community.

The 12-bit machine, Ackley claimed, is offered at about a 17% reduction for "equivalent configurations" of the PDP-8 series, in quantity, and about 10% cheaper for single units.

The DEC software is mostly compilers, protected by copyright and which has been purchased by Ackley's business, he stated, as well as some application programs in the public domain.

An official of DEC said he was aware that some of the copyrighted programs were being offered to the New Jersey company's customers, that there was no licensing agreement, and that "certain

software" had been placed in the public domain.

Ackley said the use of the DEC software presented no problem for those programs in the public domain, and that the copyrighted programs were simply purchased from DEC and then resold.

"There are no licensing agreements, just straight purchases" with DEC, Ackley commented.

Thus DEC becomes, perhaps unwillingly, an OEM software supplier, for

while the mini leader claimed it would "protect" the use of its copyrighted programs, there are antitrust implications in trying to limit the use of DEC software on DEC machines.

Another mini manufacturer is trying such a limitation, Ackley reported, but it has not been tested in the courts. He did state his company would soon start shipping a minicomputer compatible with Data General equipment, and might get a chance to test that restriction.

Key-to-Tape, -Disk Data Entry Systems Should Double Sales

LOS ALTOS, Calif. — Creative Strategies, Inc., research and consulting firm, has forecast a strong growth in key-to-tape and key-to-disk data entry systems during the next five years. Total sales of such devices are expected to nearly double their 1970 level, reaching almost \$250 million by 1975, the firm said.

The substantial growth in this segment of the data entry industry is one of the findings of a study recently published in

Creative Strategies' Investment Planning Service series.

Annual sales of stand-alone data recorders (key-to-tape) have grown to a level of over \$100 million since their introduction in 1965. This growth has resulted from cost savings that materialized with the use of high-speed electronic recording, rather than the electromechanical operation and card handling associated with keypunches.

Shared processor systems become competitive with punched card systems in installations of 12 or more keypunch and verifier units, and thus are used primarily in central computer input facilities where large volumes of data are prepared for computer input. During the 1970-75 period, sales of shared processor systems will grow from \$22 million annually to \$135 million, a compound annual growth of 44%, CSI predicted.

Despite this growth, the study forecasts a major shakeout within this subsegment, because there are presently more new, financially weak companies than the market can support.

Wema Tells Government

More Foreign Markets Needed

WASHINGTON, D.C. — The Western Electronic Manufacturers Association (Wema), representing 580 companies in electronic manufacturing and information technology in the 13 western states, told congressional representatives here that the ability of some companies to sell internationally has been the difference between life and death in the past year.

In support of expanding worldwide markets, and increased foreign competition, Wema proposed that the President should be authorized to negotiate aggressively with Japan for admission of high-technology products it now excludes. As part of the problem with competition with Japan, the group pointed out industry concern about the near future invasion of U.S. markets by Japanese computers.

High technology products entering Japan are penalized by a 10% higher tariff than low technology items. On the other hand, the U.S. has substantially lower tariff on high technology products.

Also called for was more government support of high technology industry such as that provided by Japan and other Western countries. Government aid elsewhere includes tax incentives and long-term loans at low interest rates. Even though the U.S. foreign trade situation has worried the last two administrations, no such support is provided here, according to Wema President R.C. Mercure.

Other points brought up were the positions that U.S. industries should be allowed to sell the same products to communist countries that our NATO allies do, without the red tape that makes us less competitive.

Congress should pass presently offered bills to give more funds and freedom to the Export-Import Bank, to give tax incentives to manufacturers of products for export, and prepare U.S. participation in the European Multipartite Accord on

components standards, according to Wema.

In the domestic area, Wema called for cooperation by government and industry to form a national science and technology policy which could preclude the catastrophic effects of the present cycle in defense and space spending.

Zenith's High-Resolution Laser Features Acousto-Optic Deflector

CHICAGO — Zenith Radio Corp. has developed a high-resolution laser deflector, the D-70R, which it said will open new possibilities for the use of laser light in data processing systems, video and microfilm recording, mural-sized television picture projection, and the storage and retrieval of information on microfiche.

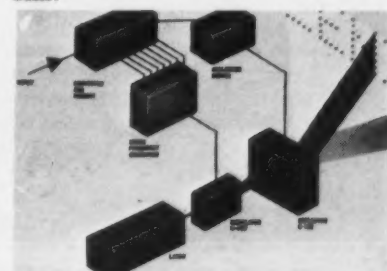
The deflector consists of an acousto-optic head and a solid-state signal package that can be remotely mounted. The head uses glass instead of exotic crystals as the basic interaction medium. Dr. Robert Adler, Zenith vice-president and director of research, said the unit "offers resolution of 400 spots, using the Rayleigh criterion, and points the way to more sophisticated equipment with resolution up to 1000 spots in the near future."

The acousto-optic deflector head of the D-70R consists of a solid glass block and a specially designed ultrasound (70 MHz center frequency) transducer. In operation, the sound waves pass through the laser light beam diffracting most of the light in a direction which is determined by the frequency of the sound. By varying the sound frequency, the diffracted light beam is made to scan.

In one practical application, the system using the D-70R takes the computer

input and translates it into a visual display or prints it on film. One advantage of the use of laser light in printing on film is that the concentrated light permits the use of low-sensitivity film which has high resolution and in some cases can be dry-developed.

The D-70R deflector, in conjunction with an M-40R modulator, was demonstrated for the first time at the Electro-optic Design Conference at Anaheim, Calif.



Zenith's acousto-optic laser deflector, the D-70R, is used in conjunction with the Zenith M-40R acousto-optic laser modulator. A generated signal with a 7 by 5 matrix of dots per letter serves as input to the converter — an array of seven phototransistors and seven memories.

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Executive Corner

Other Moves

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■ Wesley S. Melahn has an-

MISSISSIPPI STATE CENTRAL DATA PROCESSING AUTHORITY

Advertisements for Bids
Sealed proposals will be received by the State Central Data Processing Authority, 508 Robert E. Lee Building, Jackson, Mississippi 39202, up until 2:00 p.m., Monday, June 28, 1971, for the following data processing equipment:

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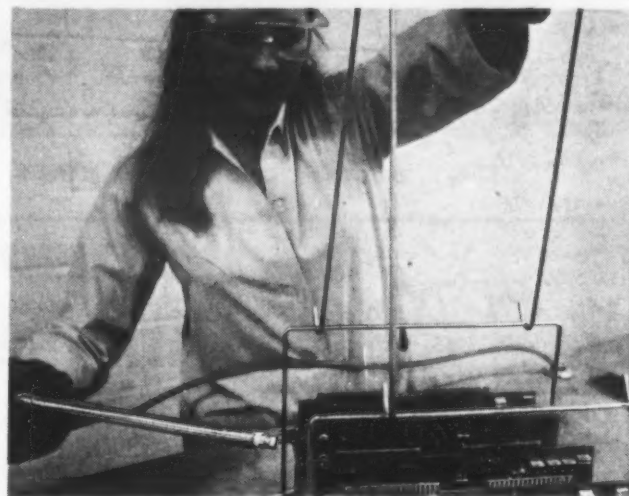
Request for Proposal No. 36 — Lease of a computer system with 32,000 characters of memory, 4 tape drives (35 KC @ 800 bpi, 70 KC @ 1600 bpi), 650 L.P.M. printer, 600 C.P.M. reader, and 100/400 C.P.M. punch.

Request for Proposal No. 37 — Lease of four (4) keyboard to magnetic tape devices, capable of encoding 9 channel, 800 bpi, N.R.Z.I., magnetic tapes.

Detailed proposal specifications may be obtained from the office of the State Central Data Processing Authority.

The State Central Data Processing Authority reserves the right to reject any and all bids and proposals and to waive informalities.

STATE CENTRAL DATA PROCESSING AUTHORITY
Charles L. Guest Executive Director



Ultra-Clean

Circuit cards for IBM's System/7 undergo ultrasonic cleaning and solvent spraying to remove contaminants accumulated during assembly operations. Ultrasonic vibration has long been used by physicians to treat "tennis elbow" and other calcium deposits.

Contracts

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Electronic Communications, Inc., an NCR subsidiary, has received a contract from Nasa's Marshall Space Flight Center in Huntsville, Ala., to design and develop an actuator interface unit for the flight-control system in Nasa's forthcoming space shuttle.

Entrex, Inc., Manchester, N.H., has received a contract from New Hampshire Insurance Group for System 480 computer-based data entry equipment.

The Defense Communications Agency of the U.S. Department of Defense has awarded a \$715,000 contract to Data Systems Analysts, Inc., Pennsauken, N.J., for programming to enhance the operation of the overseas portion of the Autodin network.

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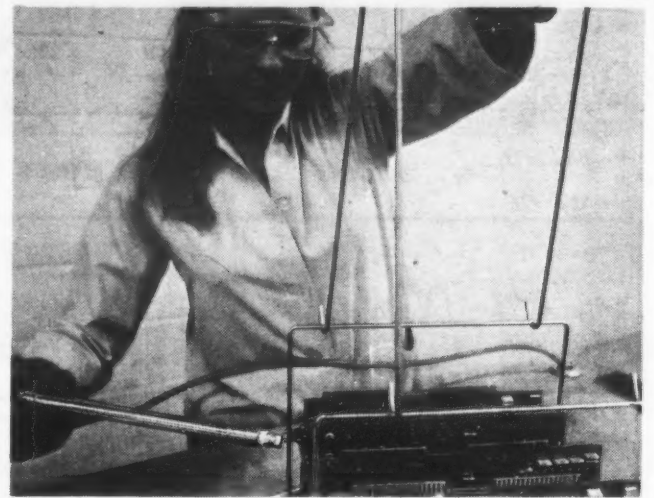
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Electronic Communications, Inc., an NCR subsidiary, has received a contract from Nasa's Marshall Space Flight Center in Huntsville, Ala., to design and develop an actuator interface unit for the flight-control system in Nasa's forthcoming space shuttle.

Entrex, Inc., Manchester, N.H., has received a contract from New Hampshire Insurance Group for System 480 computer-based data entry equipment.

The Defense Communications Agency of the U.S. Department of Defense has awarded a \$715,000 contract to Data Systems Analysts, Inc., Pennsauken, N.J., for programming to enhance the operation of the overseas portion of the Autodin network.

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Advertisements for Bids
Sealed proposals will be received by the State Central Data Processing Authority, 508 Robert E. Lee Building, Jackson, Mississippi 39202, up until 2:00 p.m., Monday, June 28, 1971, for the following data processing equipment:

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Request for Proposal No. 37 — Lease of four (4) keyboard to magnetic tape devices, capable of encoding 9 channel, 800 bpi, N.R.Z.I., magnetic tapes.

Detailed proposal specifications may be obtained from the office of the State Central Data Processing Authority.

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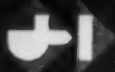
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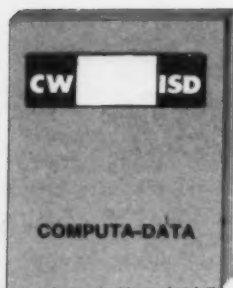
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Group I New Products and Applications

The data offered in these Reports and Profiles describe new products being offered to and by the data processing industry. Included are applications for these products as well as new applications for existing products. Reports include names of suppliers; users who have developed new applications for products; new general developments in the field.



(Circle No. on coupon)

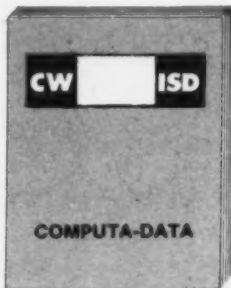
- 1 Computers & Minicomputers
- 2 Terminals
- 3 Software
- 4 Components
- 5 Supplies
- 5A Input Devices
- 6 Services
- 6A Peripherals (other than terminals and input devices)

Group II Installation Contracts

This Profile deals with the granting of data-processing contracts. Included are contracts for hardware, software, and peripherals. The information reported includes, when available, the names of the companies involved in the contract; a statement of the proposed work; the length of the contract, its proposed start-up date, etc.

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- 7 Installation Contracts



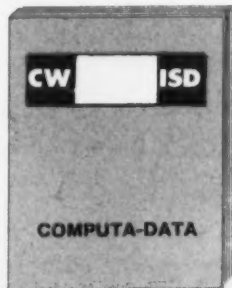
Group III Industry News

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- 8 EDP Mergers & Acquisitions
- 9 New Companies & Services
- 10 EDP Activities & Trends
- 10A Foreign Marketing Trends & Forecast
- 10B Corporate Data (financial & marketing activities of EDP companies)

Group IV User-Markets: Developments and Applications

Data-processing developments and applications for specific markets and uses of available products (hardware, software, services, etc.) are highlighted in these Reports and Profiles. Included are data detailing how the product is used for specific jobs; its value to specific user-markets; users of the product; companies offering the product; availability of the product; components of packages for user-markets.



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- 11 Accounting
- 12 Banking
- 13 Insurance
- 14 Military
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- 18 Transportation/Reservations
- 19 Financial
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- 21 Education
- 22 Law Enforcement
- 23 Legal
- 24 Government
- 24A Pollution Control

Group V Reports and Profiles for Specific Job Titles

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Judge Dismisses Case Involving IBM DP Customer List

Special to Computerworld

WHITE PLAINS, N.Y. — The charge against a former New York insurance agent accused of trying to sell copies of a computer customer list allegedly stolen from IBM has been dismissed by a county court judge here.

Judge Angelo Ingrassia dismissed the charge of possession of stolen property at the conclusion of the prosecution's case for lack of evidence that the list had been stolen. "I must give the defendant the benefit of the doubt," Ingrassia said, ruling that the prosecution had shown the list was gotten improperly, but not necessarily stolen.

"It could have been acquired after loss or misplacement," the judge said.

The judge, in dismissing the case, chastised IBM for investigating the case itself in an effort to find the "lead" instead of going to the legal authorities immediately. The judge blamed the improper investigation of the case by IBM for the lack of evidence which he said left him no alternative but to dismiss the charge.

Trial Testimony

The defendant, John C. Scott, 38, of West Haverstraw, N.Y., allegedly admitted to trying to sell the list to more than 25 competitors of IBM and companies in related fields, according to trial testimony. The list referred to as IBM's "main-frame" report for the eastern region contained the computer installation dates of all IBM's customers in the eastern third of the nation up to a year in advance, according to the prosecutor in the case, Westchester County Assistant District Attorney Roger Sirlin.

Defense Attorney Arthur Spring maintained the customer list was no different from others advertised in computer trade journals. Sirlin had disagreed, saying that lists advertised for sale are four or five years old, but that the IBM list was "perfect" — both complete and up to date.

The list was allegedly stolen from IBM's eastern regional of-

fices in New York City in January 1969. Scott, a former employee of the Perry Insurance Agency in Hartsdale, N.Y., allegedly admitted to have acquired the list from a man he knew only as Steve while he, Scott, was tending bar part-time at a New York City club.

According to testimony, Scott also said he could have gotten more lists from Steve whom he described as an inside man at IBM. Scott was tracked down by

IBM security agents on reports from several companies that they had been approached by someone trying to sell the stolen list.

One of the agents, William McGlynn, testified he had posed as a partner in the Data Usage Co. in Fort Lee, N.J. at a meeting with Scott in the company's offices on Feb. 27, 1969. At that time McGlynn testified that Scott offered to sell him the list for \$3,000 admitting it was "hot

merchandise." When McGlynn hesitated, Scott allegedly said this was "industrial espionage" and "everyone had to take chances in this kind of work."

He claimed one manufacturer had already bought the list for \$10,000 with "no questions asked." When McGlynn insisted on paying for the list by check, Scott refused to sell it and the meeting was ended, McGlynn said.

Later confronted with the fact

that he was an IBM security officer, McGlynn said Scott turned over all the lists he had and promised to discontinue his activities.

According to one witness, the lists were worth a total of about \$37,000 if sold on a non-repetitive basis in the market in April 1969 when he first saw them.

The witness said he refused to buy the list from Scott at a meeting with him.

ANNOUNCING



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financial

Change in Accounting Procedures Lowers Telex Earnings for Fiscal '71

TULSA, Okla. — Aided by increased revenues from its computer products section but hampered by a change in accounting procedures and a \$1.6 million extraordinary charge, Telex Corp. reported earnings for the fiscal year ended March 31, 1971, of \$5.5 million, or 53 cents per share, compared with earnings of \$6.8 million, or 65 cents per share for fiscal 1970.

Revenues increased to \$81.5 million from \$57.3 million in the prior fiscal year, a rise of 42%. Most of the increase is attributable to the computer products portion of the company, Telex said.

Results for the year are not comparable to reported results in prior years because of a change in accounting procedures. During fiscal '71 Telex retained ownership of a much greater portion of computer peripheral equipment it leased to end-users, rather than selling

most of such equipment to third-party leasing companies.

This policy change led to the decision to use the operating method for the fiscal year 1971 for computer equipment placed in the field.

Income from retained equipment is now recognized monthly as rentals are invoiced instead of in full at the time the equipment is leased to an end-user.

During the year Telex actually delivered computer peripheral equipment which had a sales value of \$80.9 million as compared with \$31.3 million of such equipment delivered last year.

The portion of these amounts actually included in revenues in the income statement was \$50.8 million in fiscal '71 compared with \$28.6 million in the prior year.

Company backlog at March 31, 1971 was \$65.3 million compared with \$29.3 million at the same date a year earlier.

The extraordinary charges consisted of two nonrecurring items. One was the write-off of "good will" previously carried on the balance sheet with respect to the home entertainment audio products group together with other special costs involved in consolidating the previously autonomous home entertainment group with the communications group. The second item was a write-off of Telex loans to Computer Micro-Image Systems Inc.

Firm Is 'Strengthened' Despite Losses, Cogar Says

By a CW Staff Writer
SCHUYLER, N.Y. — Despite increasing bad news concerning the company's earnings picture, Cogar Corp. President George R. Cogar told stockholders recently that the firm has been "strengthened and is in a better position [now] to move ahead and attain its goals."

The optimism was expressed in a report accompanying the firm's unaudited six-month fiscal statement showing revenues of \$337,953 and a loss of \$5.5 million or \$2.79 per share.

General and administrative chores took the largest chunk of operating expenses during the six-month period, amounting to over \$1.75 million. Other major operating expenses included manufacturing (\$1.7 million), development (\$1.2 million), marketing and sales (\$865,453) and interest costs (\$331,559).

During the period, the firm managed to double its retained deficit, starting with a deficit of \$5.2 million and ending the period with a deficit of over \$10.7 million.

At the same time, the corporation also announced a move that will allow an unnamed institutional investor to acquire a larger share of the company than had originally been planned.

The investor agreed in January to purchase 120,000 shares of Cogar at \$50 each for a total investment of \$6 million, and had already purchased \$3 million worth of the company's securities at that price.

Under the new arrangement, the investor will be allowed to buy the stock at the market price on the day of each take-down or at the \$50 price, whichever is lower.

This will not reduce the dollar commitment, but will result in the investor receiving additional shares in the firm.

What Happened?

According to George Cogar, the firm was caught in a cash squeeze as it tried to penetrate the market with its end-user products, the Cogar 4 media conversion system to emulate keypunch and key-to-tape de-

vices, and the Cogar 70 semiconductor expansion memory for the IBM 360 system.

Cogar was hurt along with many others because of weakness in the OEM marketplace, or as Cogar said: "The timing of OEM sales was delayed beyond our expectations and consequently it was necessary for us to alter our business plan to reduce the requirement for lease capital to a level consistent with outright sales."

Cogar said the management's optimism for the future was based on three factors. First, he said that the firm had entered into a long-term contract with International Computers Ltd. to supply memory systems for the ICL 1904S system.

In May the firm entered into a contract with a "major" U.S. equipment supplier, whereby Cogar will supply parts of the System 4 for inclusion into that manufacturer's products, Cogar noted.

The third cause for optimism, he said, was the recent receipt of a contract for the outright sale of memory systems for Models 30, 40 and 50 of the 360 series. In June, he promised, the firm would announce an expanded line of 360-compatible memories.

SDC Earnings Up For Nine Months

SANTA MONICA, Calif. — System Development Corp. (SDC) has reported earnings of \$657,000 and sales of \$34.1 million for the first nine months ended March 27, 1971. This compares with a loss of \$14,000 and sales of \$42.7 million for the similar period last year.

For the third quarter, net earnings were \$20,000 and sales were \$11.3 million. During the last fiscal year, SDC reported a third quarter loss of \$171,000 and sales of \$14.5 million.

The earnings were influenced materially by an extraordinary item, a tax loss carryforward, which was used up early in the second quarter.

Nickels & Dimes

Datron Systems Inc. seems to be doing more than its share in keeping parent International Controls Corp. in the black. In comparison with the other majority-owned subsidiaries, in both 1969 and 1970 Datron Systems units had the highest percentage of gross profits in relation to total sales and tangible net assets employed.

\$\$\$

Bache & Co. projects Mohawk Data Sciences will register share profits of about \$1 in fiscal 1972, and, based almost solely on sustained rental income growth, share profits could advance to the \$1.65 level in the following year.

\$\$\$

Dividends, here and now: RCA declared a quarterly dividend of 25 cents per share on common stock to holders of record June 14, 1971, payable Aug. 2, 1971.

\$\$\$

Burroughs shareholders of June 25 will receive a quarterly dividend of 15 cents payable July 20.

\$\$\$

Three types of computerized tapes on daily New York Stock Exchange transactions will be offered by the exchange. The closing price tape will be available at 4:30 p.m., the range and total transaction tapes at 7:30. The latter will include all volume figures, even those deleted from the ticker tape because of heavy trading.

\$\$\$

Victor Comptometer Corp. indicated it expects its DP division, which was created less than two years ago, will reach a breakdown point this year.

\$\$\$

Levin-Townsend Computer sold 200,000 shares of its ownership in Digital Applications, Inc. to Gregg Young, who assumes the posts of chairman and president at DAI. Young now holds about 24% of available DAI stock.

\$\$\$

Computing & Software Inc. indicated it expects to continue the earnings trend of the first half of the year, when earnings rose from \$3.1 million to \$3.3 million on a sales rise from \$42.8 million to \$43.7 million. Of the firm's total revenue, peripheral products account for 3%, while 80% comes from business information services, according to C&S, which began trading on the big board under the symbol CSW.

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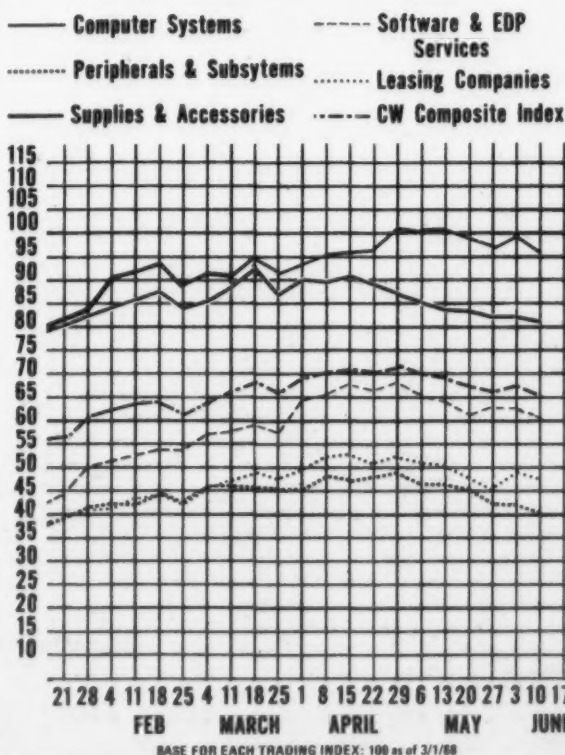
CLOSING PRICES THURSDAY, JUNE 10, 1971

	1971 RANGE (1)	CLOSE JUN 10 1971	WEEK NET CHNGE	WEEK PCT CHNGE
SOFTWARE & EDP SERVICES				
D ADVANCED COMP TECH	1- 4	1 7/8	+ 3/8	+25.0
A APPLIED DATA RES.	5- 13	7 7/8	- 3/4	-8.6
O APPLIED LOGIC	1- 3	1 1/8	- 1/8	-10.0
O ARIES	1- 2	1 1/4	0	0.0
N AUTOMATIC DATA PROC	44- 62	62	+2 3/8	+3.9
O AUTO SCIENCES	5- 8	5 1/8	- 1/2	-8.8
O BOOTHE DATA SYS	1- 2	1 5/8	- 1/8	-7.1
O BRANDON APPLIED SYS	1- 1	3/4	0	0.0
O COMPUTER ENVIRON	1- 2	1 1/8	0	0.0
O COMPUTER INDUS.	4- 5	4 1/2	- 1/2	-10.0
O COMPUTER NETWORK	3- 10	6	- 1/2	-7.6
O COMPUTER PROPERTY	6- 11	7	- 1/4	-3.4
N COMPUTER SCIENCES	9- 17	15 1/2	- 1/8	-0.7
O COMPUTER TASK GROUP	1- 3	2	0	0.0
O COMPUTER USAGE	5- 16	8 5/8	+1	+13.1
O COMP AUTOMOT REPORTS	6- 13	10	- 1/4	-2.4
A COMPUTING & SOFTWARE	27- 45	37	-2 1/2	-6.3
O COMRESS	2- 4	3 3/8	- 1/4	-6.8
O COMSHARE	4- 8	5 3/4	0	0.0
O CONSOL. ANAL. CENT.	1- 2	1 5/8	0	0.0
O DATA AUTOMATION	1- 4	1 7/8	- 1/8	-6.2
O DATA PACKAGING	7- 10	7 1/4	- 1/2	-6.4
O DATAMATION SERVICE	1- 3	7/8	- 1/8	-12.5
L DATATAB	4- 10	9	0	0.0
O DIGITEK	1- 3	1 7/8	- 1/8	-6.2
O EDP RESOURCES	7- 16	12 1/4	- 1/4	-2.0
A ELECT COMP PROG	3- 7	5 7/8	- 1/8	-3.1
N ELECTRONIC DATA SYS.	59- 85	67 3/4	-1 1/8	-1.6
O INFORMATICS	7- 15	12 1/4	+ 3/8	+3.1
A ITTEL	15- 23	15 3/4	0	0.0
O KEANE ASSOCIATES	9- 14	6 1/4	- 1/4	-3.8
O KEYDATA CORP	9- 14	9 1/4	- 3/4	-7.5
A MANAGEMENT DATA	8- 11	10 1/4	+ 5/8	+6.4
O NATIONAL CSS INC	7- 14	11 1/2	- 1/2	-4.1
O NAT COMP ANALYSTS	1- 4	1 7/8	- 3/8	-16.6
O NAT.COMP. SERV.	2- 3	3 1/4	- 1/4	-7.1
N PLANNING RESEARCH	16- 26	20 5/8	- 7/8	-4.0
O PROGRAMMING METHODS	18- 29	23	+ 1/2	+2.2
O PROGRAMMING & SYS	2- 4	2 1/8	- 3/8	-15.0
L PROGRAMMING SCIENCES	1- 3	1 1/4	0	0.0
O SCIENTIFIC RESOURCES	1- 2	7/8	0	0.0
D SOFTWARE SYSTEMS	1- 2	1 1/4	- 1/4	-16.6
O TBS COMPUTER CENTERS	5- 9	5 3/8	+ 1/8	+2.3
O TOLLEY INTL CORP	3- 8	5 7/8	- 1/8	-2.0
O UNITED DATA CENTER	2- 6	4 1/4	- 1/8	-2.8
N UNIVERSITY COMPUTING	21- 38	36	0	0.0
A URS SYSTEMS	7- 11	7 7/8	0	0.0
D U.S. TIME SHARING	1- 3	1 5/8	- 1/8	-7.1
O VORTEX CORP	1- 2	2 1/4	+1 1/4	+125.0
PERIPHERALS & SUBSYSTEMS				
N ADDRESSOGRAPH-MULT	24- 48	45	-2	-4.2
O ALPHANUMERIC	3- 6	3 1/2	- 3/8	-9.6
N AMPEX CORP	17- 25	17 3/4	- 3/4	-4.0
O ASTRODATA	1- 2	1 1/4	- 3/8	-23.0
O ATLANTIC TECHNOLOGY	3- 8	5 1/4	- 3/8	-6.6
A BOLT, BERANEK & NEW	6- 8	6 3/4	- 1/4	-3.5
N BUNKER-RAMO	10- 17	13 1/2	+ 1/4	+1.8
A CALCOMP	23- 33	24 1/2	- 5/8	-2.4
O COGNITRONICS	5- 9	5 5/8	- 5/8	-10.0
O COLORADO INSTRUMENTS	4- 8	4	- 1/8	-3.0
O COMPUTER COMMUN.	6- 19	9 7/8	-1 1/8	-10.2
A COMPUTER EQUIPMENT	4- 7	5 1/2	- 5/8	-10.2
A COMPUTEST	12- 20	12 1/2	-1	-7.4
O CONSOL COMPUTER LTD.	8- 12	10 1/8	- 7/8	-7.9
A DATA PRODUCTS CORP.	6- 10	7	-1	-12.5
O DATA TECHNOLOGY	3- 9	6 7/8	+ 1/8	+1.8
O DIGITRONICS	4- 8	5 3/8	0	0.0
N ELECTRONIC M & M	8- 16	14 1/4	- 3/4	-5.0
O FABRI-TEK	2- 4	3 3/8	0	0.0
O FARRINGTON MFG	0- 3	3/8	- 3/4	-66.6
O FOTO-MEM INC	1- 6	1	0	0.0
O INFOTEK INC	31- 48	37 1/2	+2	+5.6
O INFORMATION DISPLAYS	5- 8	7 1/8	+2 1/4	+46.1
O MANAGEMENT ASSIST	1- 2	1	0	0.0
A MARSHALL INDUSTRIES	17- 27	17	-1 3/8	-7.4
A MILGO ELECTRONICS	18- 26	18 1/4	+ 1/2	+2.8
N MOHAWK DATA SCI	23- 47	38 7/8	-2 1/8	-5.1
O ON LINE SYSTEMS INC	7- 18	14 3/4	0	0.0
O OPTICAL SCANNING	13- 18	12 1/2	- 3/4	-5.6
O PHOTON	7- 12	9 5/8	- 1/2	-4.9
O PHOTO-MAGNETIC SYS.	1- 5	3 1/2	- 1/2	-12.5
A POTTER INSTRUMENT	17- 25	18 3/4	- 3/4	-4.2
O PRECISION INST.	7- 16	15	+5	+50.0
O RECOGNITION EQUIP	14- 26	18	-1 1/4	-6.4
O REDCOR CORP.	5- 9	7 1/2	+1 5/8	+27.6
N SANDERS ASSOCIATES	13- 22	18 3/8	- 5/8	-3.2
O SCAN DATA	6- 11	8 7/8	0	0.0
O TALLY CORP.	10- 16	10 1/2	- 1/8	-1.1
N TELEX	15- 22	15 1/8	-1 1/8	-6.9
O VIATRON	1- 4	7/8	0	0.0
SUPPLIES & ACCESSORIES				
N ADAMS-MILLIS CORP	14- 19	13 5/8	- 7/8	-6.0
O BALTIMORE BUS FORMS	6- 10	9	+ 1/4	+2.8
A BARRY WRIGHT	8- 13	8 3/4	- 5/8	-6.6
A DATA DOCUMENTS	18- 29	22	- 7/8	-3.8
O DUPLEX PRODUCTS INC	8- 10	8 3/4	+ 1/4	+2.9
N ENNIS BUS. FORMS	9- 13	9 1/8	- 7/8	-8.7
O GRAHAM MAGNETICS	9- 33	27 3/4	+1 1/4	+4.7
O GRAPHIC CONTROLS	6- 15	14 1/4	- 7/8	-5.7
N MEMOREX	42- 78	43 3/8	-4 5/8	-9.6

	1971 RANGE (1)	CLOSE JUN 10 1971	WEEK NET CHNGE	WEEK PCT CHNGE
COMPUTER SYSTEMS				
N 3M COMPANY	96-117	114 5/8	+ 1/8	+0.1
O MOORE BUS. FORMS	37- 42	40 1/2	+ 7/8	+2.2
N NASHUA CORP	29- 46	44 3/4	+ 1/4	+0.5
O REYNOLDS & REYNOLD	37- 52	48 3/4	+2 1/2	+5.4
O STANDARD REGISTER	19- 23	22 1/8	+1 1/8	+5.3
O TAB PRODUCTS CO	8- 15	15 3/8	+2 5/8	+20.5
N UARCO	25- 33	31 1/4	0	0.0
A WABASH MAGNETICS	7- 10	7 5/8	+ 1/4	+3.3
N WALLACE BUS FORMS	18- 26	21 7/8	+ 1/4	+1.1
LEASING COMPANIES				
N BURROUGHS CORP	105-138	124 1/4	-8 1/2	-6.4
N COLLINS RADIO	14- 20	16 3/4	- 1/2	-2.8
N CONTROL DATA CORP	48- 83	63	-5 5/8	-8.1
O DATA GENERAL CORP	19- 49	43 7/8	-3 5/8	-7.6
N DIGITAL EQUIPMENT	53- 85	80 1/4	-2 1/4	-2.7
N ELECTRONIC ASSOC.	5- 9	7 1/2	- 1/2	-6.2
A ELECTRONIC ENGINEER.	5- 9	8 5/8	+ 3/8	+4.5
N FOXBORO	25- 45	44 7/8	+1 7/8	+4.3
O GENERAL AUTOMATION	11- 26	13 1/2	-1	-6.8
N GENERAL ELECTRIC	60-124	60 5/8	-61 1/2	-50.3
N HEWLETT-PACKARD CO	30- 45	42 7/8	+2 3/8	+5.8
N HONEYWELL INC	83-115	104 1/2	-3 1/4	-3.0
N IBM	310-364	321 1/2	+ 1/4	0.0
O INTERDATA INC	6- 11	10 3/4	+ 1/4	+2.3
N NCR	38- 49	46	-1 1/2	-3.1
N RCA	26- 41	40 1/4	- 1/4	-0.6
N RAYTHEON CO	27- 46	38 3/4	- 3/8	-0.9
O SCI. CONTROL CORP.	1- 2	3/4	- 1/4	-25.0
N SPERRY RAND	25- 38	34 1/2	- 3/4	-2.1
A SYSTEMS ENG. LABS	11- 18	11 3/4	-1 1/4	-9.6
N VARIAN ASSOCIATES	13- 18	14 1/2	- 3/4	-4.9
N VICTOR COMPTOMETER	17- 27	18 1/8	- 1/8	-0.6
N WANG LABS.	29- 50	46 1/8	-2 3/8	-4.8
N XEROX CORP	85-110	108 1/4	+ 7/8	+0.8
A BOOTHE COMPUTER	13- 27	21 3/4	-2	-8.4
O BRESNAHAN COMP.	2- 4	2 3/4	+ 1/8	+4.7
O COMPUTER EXCHANGE	4- 9	5	- 1/8	-2.4
A COMPUTER INVSTRS GRP	8- 14	10 3/4	- 3/4	-6.5
N DATA PROC. F & G	11- 19	14 3/4	- 7/8	-5.5
O DATRONIC RENTAL	2- 4	2 5/8	0	0.0
A DEARBORN-STORM	24- 44	41 3/4	+3 5/8	+9.5
A DIEBOLD COMP. LEAS.	5- 13	11 7/8	+ 3/4	+6.7
A DPA, INC.	4- 8	6 3/4	- 1/8	-1.8
A GRANITE MGT	9- 13	9 3/4	- 3/8	-3.7
A GREYHOUND COMPUTER	7- 11	9 3/8	- 1/8	-1.3
N LEASCO CORP	16- 23	19 1/2	- 7/8	-4.2
O LECTRO MGT INC	2- 4	3	- 1/8	-4.0
A LEVIN-TOWNSEND CMP	5- 9	6 3/4	- 3/4	-10.0
O LMC DATA, INC.	1- 1	3/4	0	0.0
O MCC INDUSTRIES	3- 8	7 5/8	- 1/8	-1.6
O SYSTEMS CAPITAL	3- 6	6 7/8	+1 3/8	+25.0
N U.S. LEASING	16- 29	28 3/4	+ 7/8	+3.1

EXCH: N-NEW YORK EXCHANGE; A-AMERICAN EXCHANGE
L-NATIONAL EXCHANGE; O-OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

BRESNAHAN COMPUTER			
Three Months Ended March 31			
	1971	1970	
Shr Ernd	\$0.04	\$0.08	
Revenue	1,488,000	1,585,000	
Earnings	91,000	155,000	
6 Mo Shr	.06	.17	
Revenue	2,985,355	2,980,680	
Earnings	122,766	325,000	

CYBERMATICS			
Year Ended March 31			
	1971	1970	
Shr Ernd	\$0.38	\$0.21	
Revenue	5,413,741	3,373,743	
Earnings	360,697	175,612	

a-Including extraordinary credit of \$14,200 (2 cents per share).

PROGRAMMED PROPRIETARY SYSTEMS			
Nine Months Ended Feb. 28			
	1971	1970	
Shr Ernd	.....	\$0.17	
Revenue	1,534,432	1,831,143	
Spec Cred	225,440	.....
Earnings	c94,153	262,000	

a-Adjusted for a 50% stock dividend in March 1970. b-Excludes discontinued operations. c-Equal to 6 cents a share.

COMPUTER INSTALLATIONS			
Three Months Ended March 31			
	1971	1970	
Shr Ernd	\$0.11	\$0.09	
Revenue	424,198	373,603	
Earnings	89,535	74,739	

IMAGE SYSTEMS			
Three Months Ended April 2			
	1971	1970	
Revenue	\$1,373,671	\$1,025,063	
Spec Cred	a101,130	.....
Loss	247,886	889,144	

a-From sale of subsidiary.

COMPUTER INVESTORS GROUP			
Year Ended March 31			
	1971	1970	
eShr Ernd	\$0.65	\$0.47	
Revenue	10,063,284	8,418,466	
Spec Cred	b55,725	.....
Earnings	c1,381,550	907,607	

a-Based on income before special credit. b-From gain of \$175,725 on repurchase of portion of the company's debentures at less than the principal amount less provision of \$120,000 for estimated loss on its investment and advances to an affiliate. c-Equal to 68 cents a share. e-On a fully diluted basis.

GRANITE MANAGEMENT SERVICE			
Year Ended February 28			
	1971	1970	

Shr Ernd	.....	\$1.08	
aRevenue	\$27,674,000	25,388,000	
bCont Op	917,000	2,427,000	
Disc Op	(7,375,000)	1,591,000	
(Loss)	(4,909,000)	2,638,000	

a-From continuing operations. b-Before U.S. and foreign income taxes.

COLLINS RADIO			
Three Months Ended April 30			
	1971	1970	
Shr Ernd	.....	\$0.05	
Revenue	\$64,935,000	80,607,000	
Earnings	(2,686,000)	168,000	
(Loss)	.....	1.10	
Revenue	211,663,000	255,960,000	
Earnings	(5,689,000)	310,000	

HUDSON LEASING CORP.			
Three Months Ended March 31			
	1971	1970	
Shr Ernd	\$0.25	\$0.25	
Revenue	7,163,428	5,882,360	
Earnings	394,036	390,763	
9 Mo Shr	.90	1.04	
Revenue	21,890,652	16,962,342	
Earnings	1,404,510	1,606,296	

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